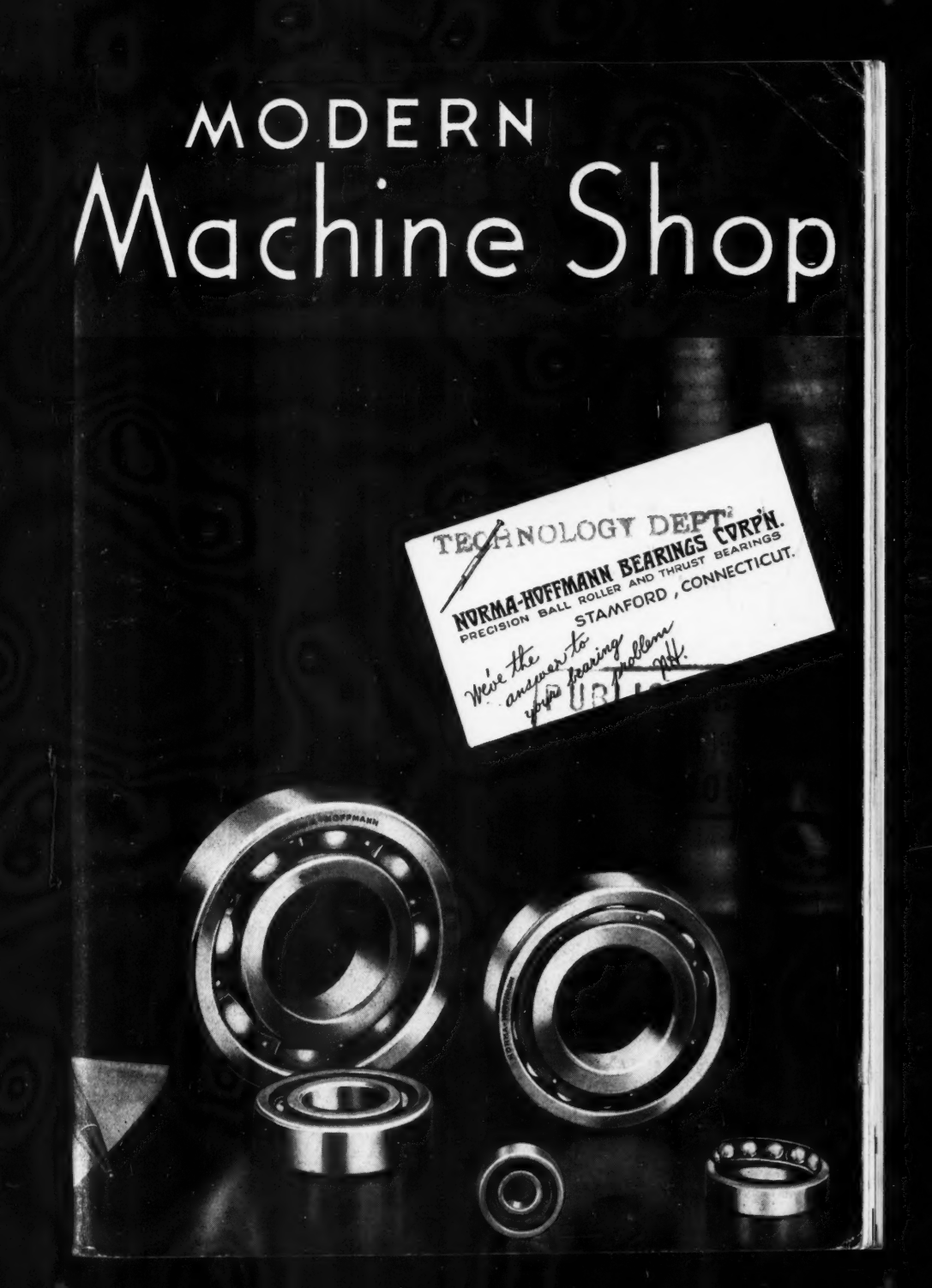
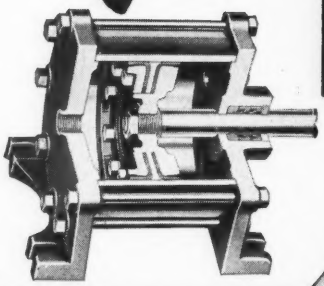
MODERN Machine Shop



Replace Inefficient Hand and Mechanical Operations...

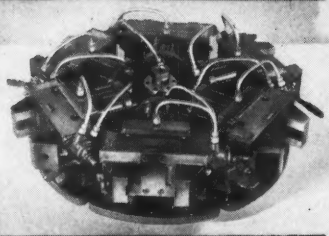
Get

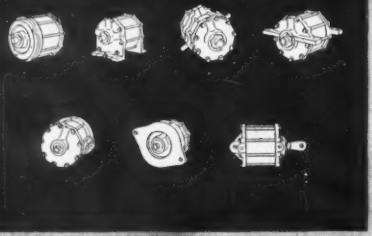


with **Logan** NON-ROTATING

AIR CYLINDERS

FOR • PUSHING • PULLING • LIFTING HOLDING and OTHER APPLICATIONS





Use *standard* LOGAN Air Cylinders to obtain profitable advantages that will increase production in industrial applications of all kinds. The constant power with follow-up assures positive, uniform actuation. Control valves may be located at any convenient point, adjacent or remote. Important savings in operator time and fatigue will result. In addition, the design of a mechanical structure can often be simplified, reducing the amount of floor space required.

LOGAN Air Cylinders are available in 7 types of mounting to fit almost every requirement; interchangeable end covers permit a wide range of combination mountings. Manufactured in sizes from 1½" to 24" bore, with any length of stroke up to 18 feet. Recommended for operation at pressures up to 150 p.s.i.

ENGINEERING ADVICE . . .
Write for recommendations on the proper cylinders for your applications and most effective methods of installation. No obligation.

USE COMPLETE LOGAN AIR EQUIPMENT . . .
For highest efficiency, use Logan equipment throughout. Logan cylinders, control valves and air accessories are designed to work together as a balanced air system.

ARMY E NAVY

FREE CATALOGS FOR YOU



Logan

Air and Hydraulic Equipment

LOGANSPORT MACHINE CO., INC. 901 PAYSON RD LOGANSPORT INDIANA

CHUCKS • CYLINDERS • VALVES • PRESSES • SURE FLOW COOLANT PUMPS

Get information on LOGAN Air Cylinders, control valves and air accessories . . . also other items in the LOGAN line.

PUBLIC LIBRARY
JUL 10 1945
DETROIT

The name that means Performance

Timken Bearing research, Timken Bearing design and Timken Alloy Steels have revolutionized the life, quality and performance of the modern anti-friction bearing.

No other anti-friction bearing is used, in such vast quantities, in so many different products, in so many different industries.

Timken Bearing is the name that means *performance.* And when you see the trade-mark "TIMKEN" on a bearing, you are assured it is the genuine product. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

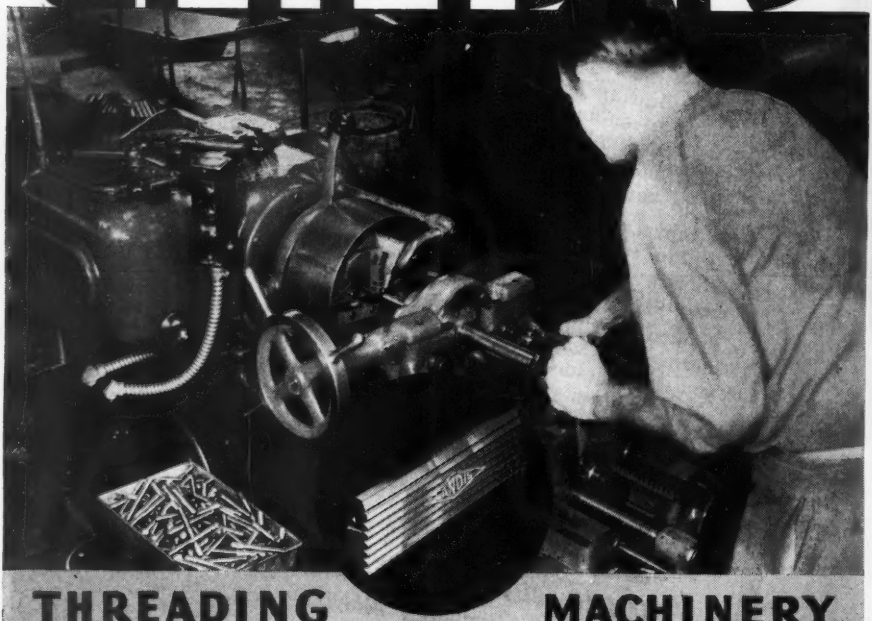
TAPERED ROLLER BEARINGS

Timken Bearings, Timken Alloy Steels and Tubing and Timken Removable Rock Bits

COPYRIGHT 1945 BY THE TIMKEN ROLLER BEARING CO.

"ALL THERE IS IN BEARINGS"

LANDIS



THREADING MACHINERY

THREAD CUTTING DIE HEADS

Greater Accuracy Higher Production at Lower Cost....
Write for Catalog

COLLAPSIBLE TAPS

LANDIS MACHINE COMPANY

WAYNESBORO, PENNSYLVANIA, U.S.A.



The Heald Method of Automatic Sizing Means Faster Production... Fewer Rejects in Internal Grinding

Add up the time your operators spend with plugs, gages, feelers, calipers—or any other manual method of checking size in internal grinding operations—and you have the best reason in the world for finding out now about automatic sizing—*the Heald way*. With a Heald Size-Matic Internal on the job, for example, your operators *don't have to think* about when your work is to size. The Heald Size-Matic knows!

An "automatic brain" is built into your Size-Matic. It assumes entire responsibility for sizing, by predetermining the exact number of wheel passes required to bring the work to the desired hole size. Sizing is done without any connection with the work. It makes no difference whether you're grinding straight or tapered holes; with or without keyways; open-end or blind; large or small. A Heald Size-Matic means that all your men do is load the work and throw the starting lever to give you faster work and better work—automatically.

MISCELLANEOUS RUNS OR VOLUME PRODUCTION

Only the simplest adjustments are required on a Heald Size-Matic to make it suitable for large production runs, or a wide variety of assorted jobs. In either type of work, tolerances are easily held within ten-thousandths. Exact uniformity is assured.

Heald has proved this automatic principle through 20 years of successful use. But a Size-Matic is only one way of securing the advantages of Heald experience with automatic operation, to gain faster, better lower cost production. Why not ask a Heald Engineer to come in and lay some interesting and profit-making facts before you?

THE HEALD MACHINE COMPANY
WORCESTER 6, MASS.

More Precision · Less Cost **HEALD**

INTERNAL AND SURFACE GRINDING MACHINES · BORE-MATIC PRECISION FINISHING MACHINES

CINCINNATI

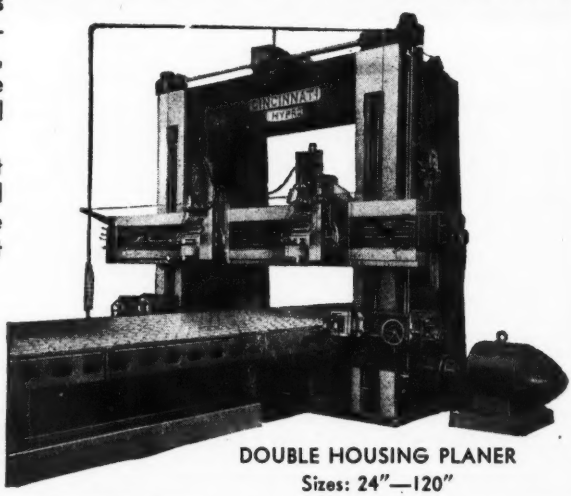
HYPRO

MEANS DEPENDABLE PERFORMANCE

Industry actually buys not only products—but how well these products do the job.

Dependable performance is the exact promise of any Hypro—a promise that has been kept for over a half a century.

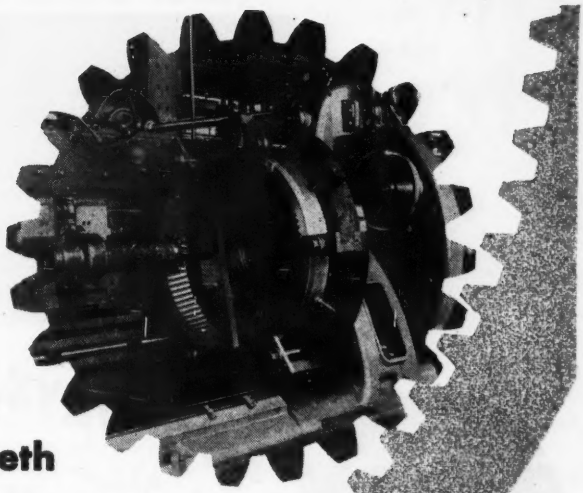
Leaders in practically all industrial fields almost without exception use Hypro machines in the products they make. Low cost operation, faster production, lower maintenance are basic integral parts of all Hypro machines.
That is why engineers, not only in America but all over the world, recognize the advantages inherent in Hypro Machines.



DOUBLE HOUSING PLANER
Sizes: 24"—120"

Let us help you solve your peacetime problems. For a complete line of Hypro Machines write for catalog No. MM-154.

THE CINCINNATI HYPRO PLANER COMPANY
PLANERS · BORING MILLS · PLANER TYPE MILLERS
CINCINNATI, OHIO



INTERNAL GEARS

with straight or single helical teeth

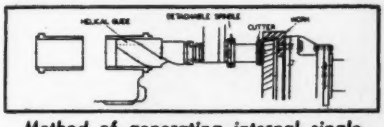
Precision Generated

~~CUT~~ BY THIS MACHINE

Internal gears are part of a wide range of gear products produced with uniform, high precision by the Farrel-Sykes Gear Generator. The gears can have either straight or single helical teeth. A typical set-up for generating an internal gear with helical teeth is shown in the illustrations.

Built with initial precision of the highest order, this machine is capable of turning out consistently precise work at a high rate for 30,000 hours (15 years of normal use) or more. Hardened, ground and lapped surfaces are used where wear could affect precision, and means are provided to compensate for unavoidable wear. Rapid reciprocation of cutters prevents temperature from affecting precision and permits extremely fine finishing cuts to be taken with facility and speed.

The gear manufacturer seeking accuracy of product, economy of operation, speed of production, or diversity of output will find the Farrel-Sykes Gear Generator an efficient machine tool of high earning capacity.



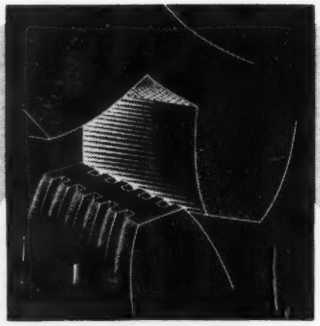
Method of generating internal single helical teeth.

It is available in four sizes for producing gears in various size ranges from 0" to 61" in diameter. Write for complete details.

F B 218

FARREL-BIRMINGHAM COMPANY, INC.
344 VULCAN ST., BUFFALO, N. Y.
Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Cleveland

FARREL



There Are

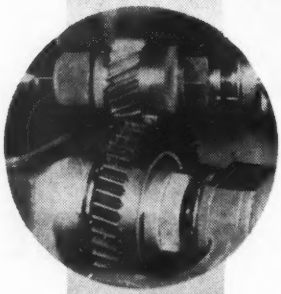
TWO WAYS

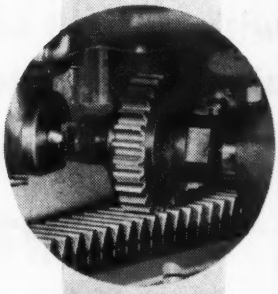
To Obtain

PRECISION GEARS

at

LOW COST







RACK SHAVING:

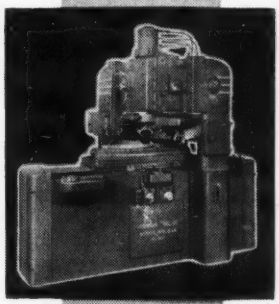
In high production there is no substitute for rack-shaving either as to precision obtainable or as to cost per gear.

Ask for Bulletin 900

ROTARY SHAVING:

Where varieties of gears in semi-production are to be produced or where quantities are lower, rotary shaving will produce gears at lower cost.

Ask for Bulletin 860



The whole story is told in Manual GF-43 available from

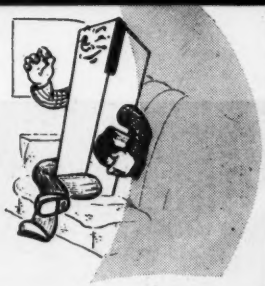
MICHIGAN TOOL COMPANY

7171 E. McNICHOLS ROAD **DETROIT 12, U. S. A.**



DON'T MAKE TOOLS WALK TO WORK...

GIVE 'EM A RIDE!



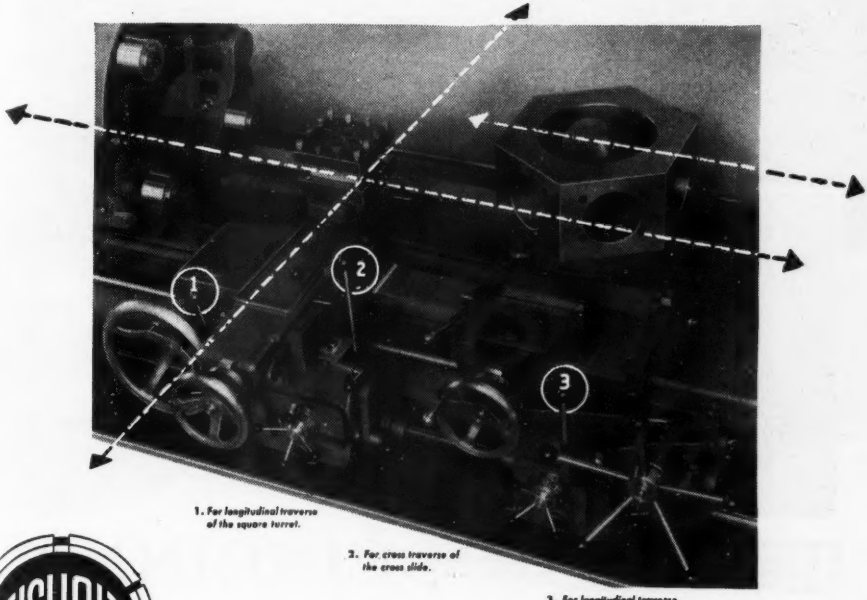
GISHOLT Standard—COMPLETE *Power Rapid Traverse* for ALL Saddle Type Turret Lathes

Here's another good reason why work goes faster on *all* sizes of Gisholt Saddle Type Turret Lathes.

There's longitudinal power rapid traverse for the hexagon turret carriage, of course. Furthermore, you'll find it provided for the longitudinal travel of the square turret carriage, and—an advantage pioneered by Gisholt—for transverse travel of the cross slide.

Quicker movement of tools in and out of cutting position reduces time between cuts. And it relieves the operator of laborious hand-turns—saves as much as one-third of his time on many jobs.

No wonder operators familiar with the *complete* traverse feature are strong for Gisholt. It helps them produce more, earn more, with less fatigue.



1. For longitudinal traverse of the square turret.
2. For cross traverse of the cross slide.
3. For longitudinal traverse of the hexagon turret.

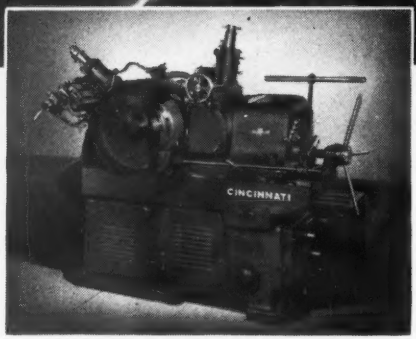
GISHOLT

GISHOLT MACHINE COMPANY
1219 *East Washington Avenue • Madison 3, Wisconsin*

Look Ahead... Keep Ahead... With Gisholt Improvements in Metal Turning

TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES • SPECIAL MACHINES





The **CINCINNATI** *Centerless illustrated above is truly a Veteran of Production Wars. It has been in continuous operation since 1937 with no down time charged against the grinding wheel spindle bearings, thanks to FILMATIC*

CINCINNATI *No. 2 Centerless Grinding Machine. Catalog G-456-2 contains complete specifications. A brief description of all* **CINCINNATI** *Grinders may be found in Sweet's Catalog File for Mechanical Industries.*

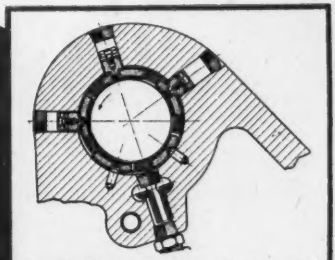
CINCINNATI

CENTER TYPE GRINDING MACHINES

CINCINNATI

FILMATIC

VETERAN OF PRODUCTION WARS

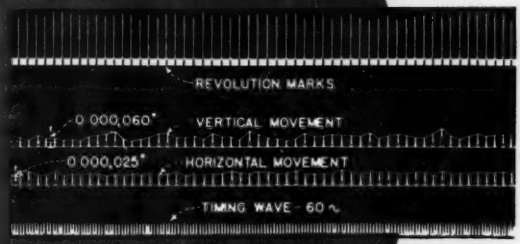


The FILMATIC principle. Self-adjusting shoes produce independent, converging oil films which develop high radial pressures, forcing spindle into central position. "The wedge-shaped oil film does the trick."

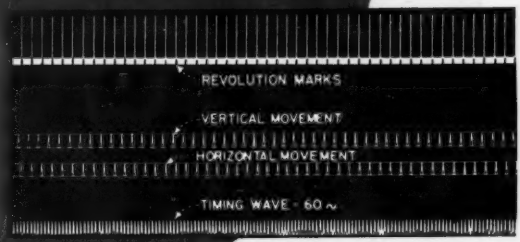
CINCINNATI Grinding Machines built several years ago are still producing at a rate equal to or greater than the original estimate, with no down time or expense due to grinding wheel spindle bearing failure. One major reason for this exceptional performance is FILMATIC Spindle Bearings. Exclusive in CINCINNATI Grinding Machines, they give you these important advantages:

1) No seizure. 2) No breakdown. 3) Eliminates spindle flutter under all operating conditions. 4) No adjusting when changing from roughing to finishing cuts. 5) Greater accuracy over longer periods of time. 6) Less wheel truing. 7) Metal removal increased as much as 30% over machines with conventional bearings.

And while FILMATIC Bearings are only one feature, they are reason enough for you to choose CINCINNATI Grinders for your centertype or centerless work. Write for booklet G-446 containing complete details about this unusual spindle bearing.



Oil-cycle bearing. Tips of wave peaks indicate the spindle position once each revolution. The irregularity in position of the wave tips indicate a slight fluttering of the spindle axis.



FILMATIC ... No discernible spindle flutter. The ... of the wave tips in this oscillogram indicates a true running spindle.

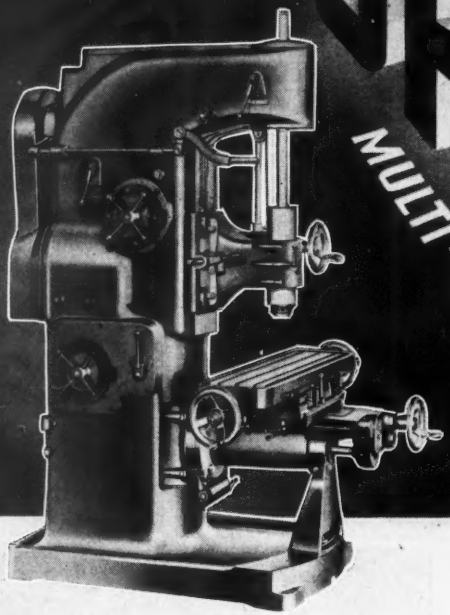
TI GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES

KNIGHT

MULTI-OPERATION MILLER



This milling machine will perform and accurately produce at all speeds and feeds to full capacity.

The KNIGHT MILLER will save you valuable hours on many jobs. A special swivel and tilting table feature saves the use of angle plates, cutters and special fixtures.

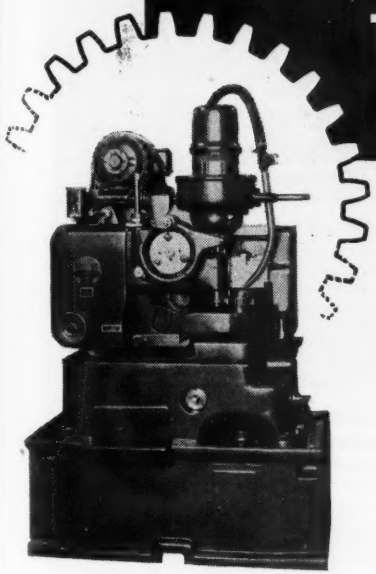
The No. 40 has a wide range of capacity fitting it for many jobs and uses. There are 16 different spindle speeds, also 16 table feeds available.

WRITE FOR FOLDER.

KNIGHT

MACHINERY COMPANY 3924 W. PINE ST. ST. LOUIS, MO.

Post-War Products will demand Better Gears than ever before



PRECISION GEARS can be cut with closest control over accuracy on the Fellows Gear Shaper—and the same machine will cut both internal and external gears.

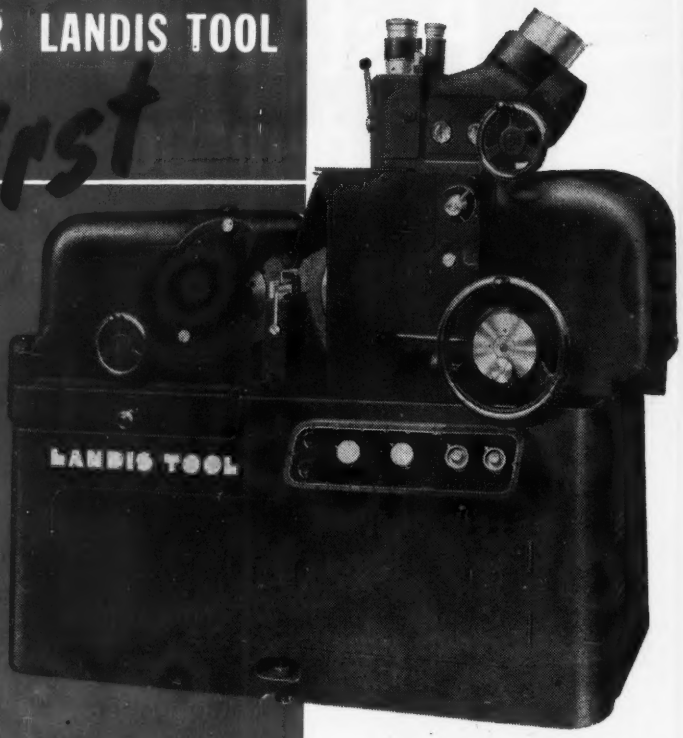
The Gear Shaper method also handles both spur and helical gears, and a Gear Shaper, by a simple substitution of cutters, can be used for cutting cams, or an infinite variety of irregular or interrupted profiles.

Every machine shop should have complete information on Gear Shaper manufacturing equipment. Write:

THE **FELLOWS** GEAR SHAPER COMPANY

78 River St. Springfield, Vermont — 640 West Town Office Building, Chicago, Illinois — 616 Fisher Building, Detroit, Mich.

ANOTHER LANDIS TOOL *First*



Landis Tool Centerless Thread Grinder complete with built-in wheel crusher.

READY NOW TO SPEED WAR PRODUCTION

CHECK THESE ADVANTAGES

GREATER ACCURACY—Warpage and distortion of threads by final heat treatment eliminated.

LESS INSPECTION—Gaging of each piece is eliminated. Only spot inspection is needed to check wheel wear.

FEWER REJECTS—Elimination of heat treatment distortion almost entirely eliminates rejects.

GREATER PRODUCTION—Production per day increases of from *two to five hundred per cent* over other methods.

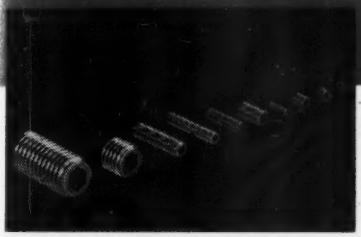
CLOSER TOLERANCES—Multi-groove grinding wheel assures that all thread forms will be exactly uniform.

BRIGHT FINISH—Threads ground from hardened stock have a distinctive clean, bright appearance.

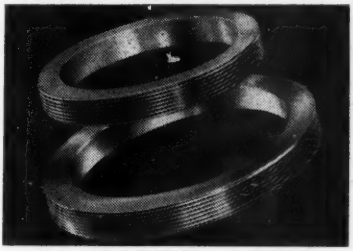
LANDIS TOOL
Precision Grinders

LANDIS TOOL COMPANY

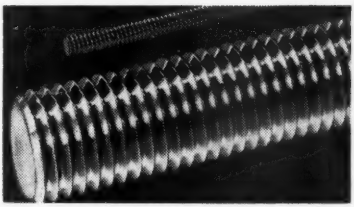
Centerless GROUND THREADS



SOCKET SCREWS—from ⅛" diameter 40 pitch to ⅝" diameter 11 pitch have been ground in production.



THREADED RINGS—hardened steel rings 5" diameter with 16 pitch threads ground in two passes.



LONG SCREWS—12" long ¼" diameter screws 20 pitch in one pass and 6" long, 1" diameter screws 8 pitch in two passes.

UP TO 500%
GREATER PRODUCTION

The new LANDIS TOOL Thread Grinder was developed to meet today's needs for increased production of highly accurate threaded parts. It is another first for LANDIS TOOL in the field of precision thread grinding—introduced *now* to speed production and help win the war. Application of the Thread Grinder to socket screws has been demonstrated by a year of development and production experience in cooperation with a leading manufacturer.

Our engineering department will be glad to consult with you on any of your thread grinding problems and make recommendations on the possibilities of the Centerless Thread Grinder.

235

LANDIS TOOL *Company*

WAYNESBORO, PENNA.

Get Carboloy Quality and Savings on Your

PRECISION FINISHING



. . . at Tool Investment Costs as low as 45c each



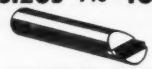
For long tool life, low tool cost and low machining cost per piece, combined with outstanding quality of work produced, use Carboloy Round Shank Tools!

Available at tool investment costs as low as 45c, Carboloy Round Shank Tools are now widely used by industry on work requiring tolerances as close as .0001" and on parts requiring mirror-like finish.

Carboloy Round Shank Tools are stocked cylindrically ground, with either back rake or flat top, in sizes 5/16" through 1/2" . . . or as solid cylindrical blanks 3/32" through 1/4" diameter. You quickly grind to suit. Write for Catalog GT-175R.

CARBOLOY COMPANY, INC.
11143 EAST EIGHT MILE ROAD, DETROIT 32, MICHIGAN
CHICAGO • CLEVELAND • HOUSTON • LOS ANGELES • MILWAUKEE
NEWARK • PHILADELPHIA • PITTSBURGH • THOMASTON
Also Sold by Leading Mill Supply Distributors

Available TIPPED in sizes 5/16" to 1/2"



or SOLID in sizes 3/32" to 1/4"



YOU QUICKLY GRIND TO SUIT



Write for Catalog GT-175R

CARBOLOY "ROUND SHANK" BORING TOOLS

FOSDICK HIGH SPEED DRILLS

do their part in producing a new weapon of war



Photo Courtesy of Fairchild Camera and Instrument Corporation

• The Fairchild camera illustrated is one of several models used to obtain vital information for all branches of our armed forces. The pictures taken supply clear and accurate information for maps, charts, bomb damage, troop and convoy movements.

Fairchild Cameras are precision instruments requiring exceptionally accurate machine work. Fosdick 6- and 4-spindle High Speed Drills are used extensively for drilling—reaming and counterboring various parts for these instruments.

The battery of 4-spindle High Speed Drills shown are drilling shutter housings for large F-56 camera—the main frame of the aerial sextant—and the shutter housing for the gun camera. These are but a few of the jobs handled by Fosdick High Speed Drills in this plant. Cases—cones—lens—shutter housings—film magazine parts—all are handled by these high speed drills for precision holes from 0.16 inch to 1¼ inch.

The tolerances maintained range from .002 inch for drilling—.0005 inch for reaming and .001 inch for counterboring.

This battery is only one of thousands of Fosdick High Speed Drills now operating in hundreds of plants producing precision work vital to our war effort.

For full particulars write for the Fosdick High Speed Drill Bulletin H.S.A.

FOSDICK MACHINE TOOL CO.
CINCINNATI 23, OHIO



Inspecting cylinder finning tools in the Wood-Ridge plant of the Wright Aeronautical Corporation. Photograph courtesy the Wright Aeronautical Corp.

Cool Millions WITH THE HELP OF JONES & LAMSON *Optical Comparators*



This book "Beyond a Shadow of a Doubt" will tell you more about our Optical Comparators and what they are doing.

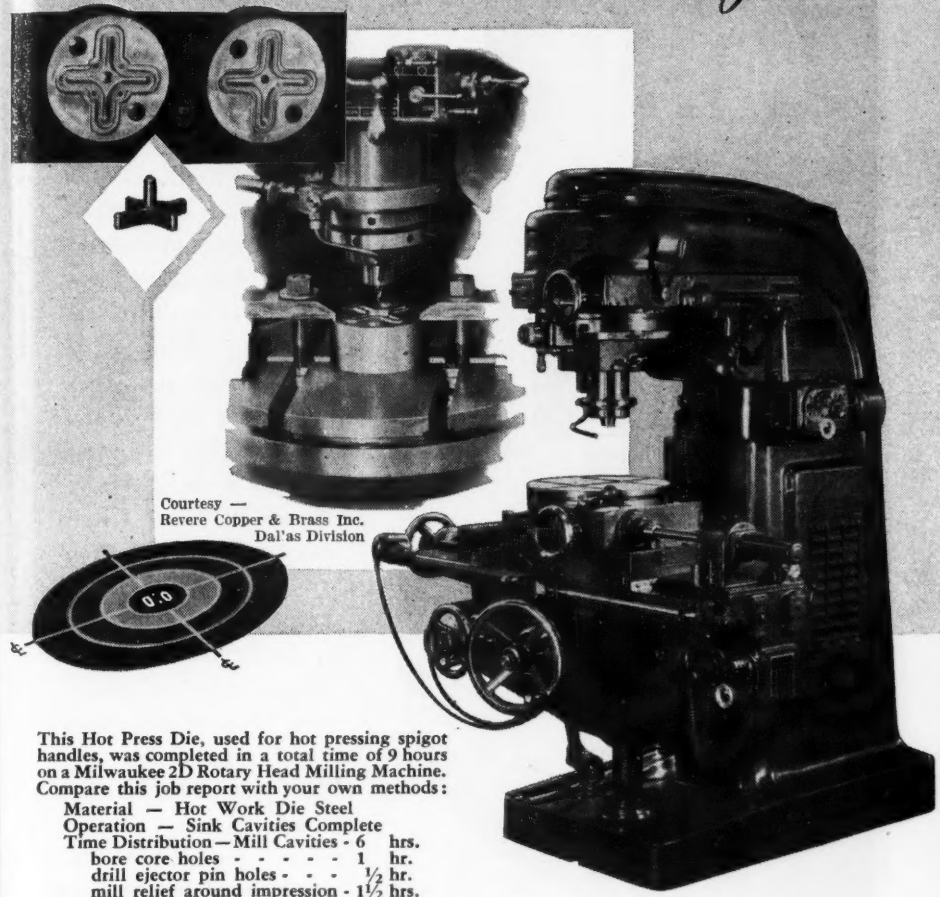
Proper dissipation of millions of heat units from the cylinders of the 2200 H.P. Wright Cyclone 18's that power the B-29 Superfortress, depends upon the perfection of the cylinder fins. To be sure that these fins are accurate —beyond a shadow of a doubt—the tools that cut them from solid metal are inspected on Jones & Lamson Optical Comparators.

Quality control by the inspection of tools, parts and products, with Jones & Lamson Optical Comparators, is an accurate, rapid process. Objects that require hours to inspect by other means can be inspected in minutes, or even seconds.

JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.

Manufacturer of: Universal Turret Lathes • Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers

What would be your Total Time on this Hot Press Die Job?



Courtesy —
Revere Copper & Brass Inc.
Dal'as Division

This Hot Press Die, used for hot pressing spigot handles, was completed in a total time of 9 hours on a Milwaukee 2D Rotary Head Milling Machine. Compare this job report with your own methods:

Material — Hot Work Die Steel
Operation — Sink Cavities Complete
Time Distribution — Mill Cavities - 6 hrs.
bore core holes - - - - - 1 hr.
drill ejector pin holes - - - ½ hr.
mill relief around impression - 1½ hrs.
Total Time - - - - - - 9 hrs.

Check these advantages of the Milwaukee Rotary Head Milling Machine and how you can benefit from them in your own shop:

DIRECT . . . mills intricate shapes in a single set-up without the aid of templets or models — transmitting blueprint dimensions and outlines directly to the workpiece.

ACCURATE . . . chances for error are eliminated because there is no change in setup. Exact control of all combinations of cutting movements — possible only with this machine — transmits mathematical precision to the work.

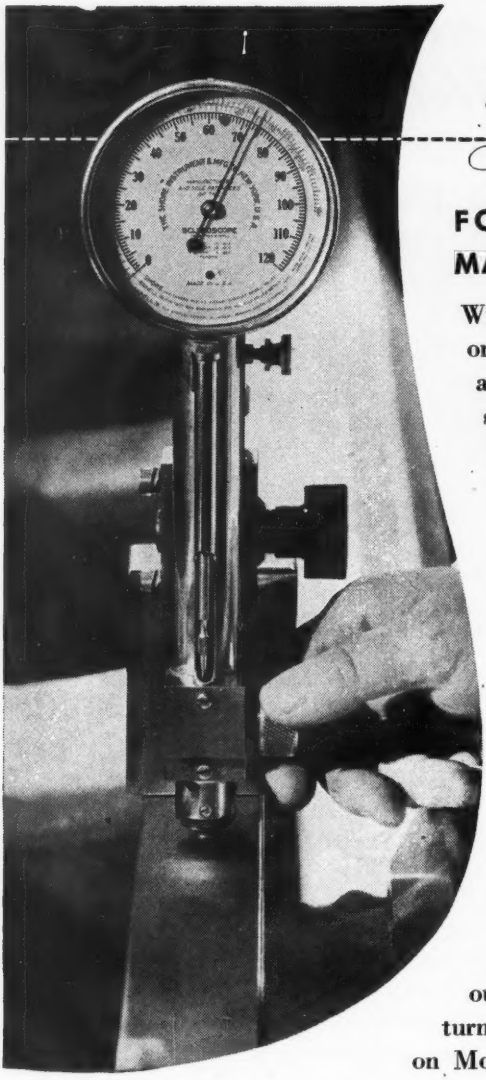
FAST . . . initial job preparation and setup time are reduced to the minimum. Accurate performance of the machine saves operator's time and results in rapid production of work otherwise difficult to perform.

Write for Bulletin No. 1002C and complete information.

BUILDERS OF MILWAUKEE ROTARY HEAD MILLING MACHINE • FACE MILL GRINDER • AUTOMETRIC JIG BORER • SPEEDMILL • MIDGETMILL • CENTER SCOPE.

KEARNEY & TRECKER

Products
CORPORATION
Milwaukee 14, Wisconsin
Subsidiary of Kearney & Trecker Corporation



Formula

FOR LONG LIFE AND MAINTAINED ACCURACY

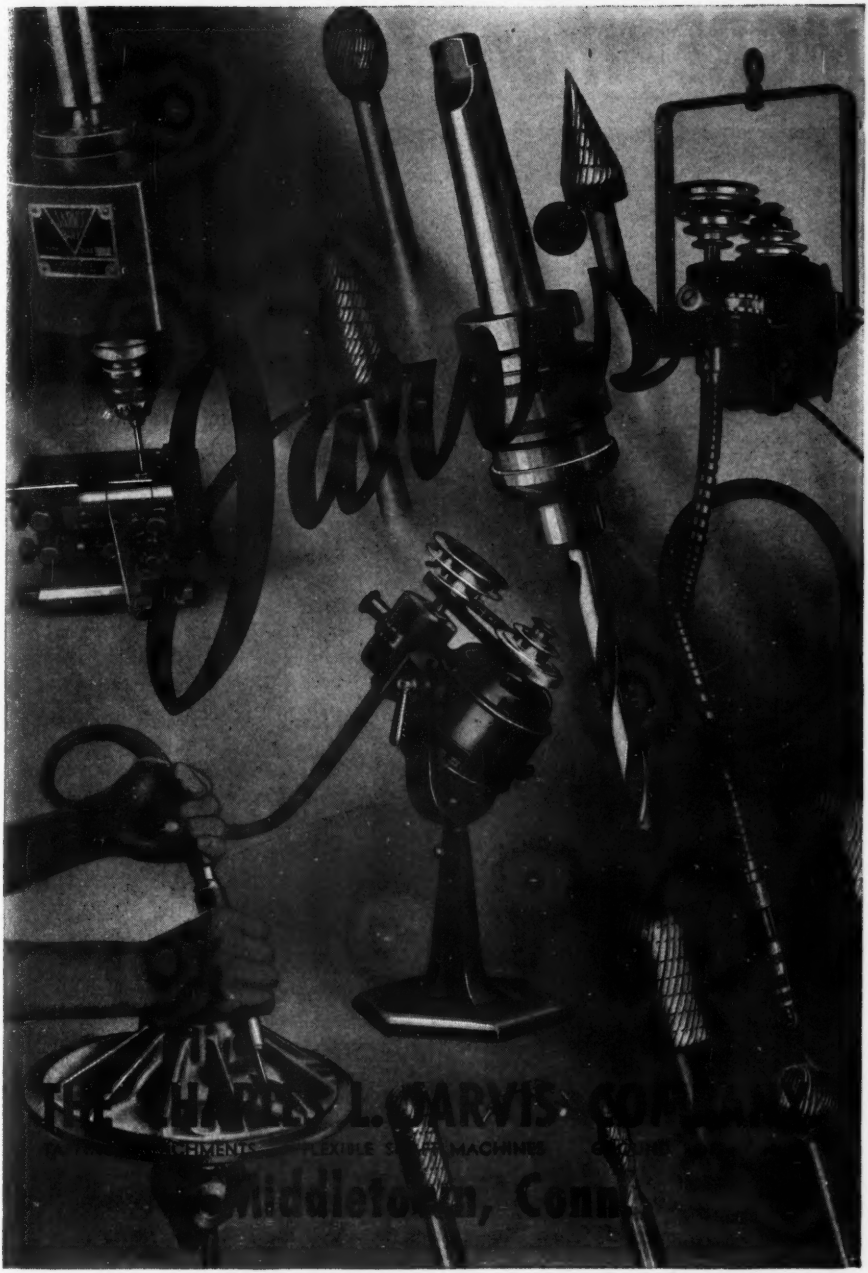
With an average hardness of 70 on the Shore Scleroscope, Monarch flame-hardened lathe beds successfully minimize wear, discourage scratching and resist scoring. Even under severe wartime use, these lathes retain their brand-new accuracy, are good for many years of service.

Since 1937, we've built more than 18,000 Monarch Lathes with flame-hardened beds. They're in use around the world, helping provide faster, more economical, more accurate production.

For complete satisfaction and for long years of outstanding service, do your turning, boring and facing work on Monarch Lathes.

THE MONARCH MACHINE TOOL CO., SIDNEY, OHIO

Monarch Saves Time


Jarvis

MORE *than a Drill Press*



Shop men know that there are no substitutes for correct design and accurate fitting in a machine tool.

Correct design means that all parts will be heavy enough to stand-up under severe service, that bearings will be large enough and of the proper type, that adjustments can be made easily and quickly.

Accurate fitting means just what it says: no sloppy fit is permissable.

Buffalo drills are built to fit these specifications. They are not built-up "hobby shop" machines, they are heavy-duty production tools which give years of 24-hour a day service. They are available in a wide range of sizes and types from the No. 15 Bench Drill to the "RPMster," the drill with 101 instantly changed speeds.

Standard equipment in many outstanding production shops, Buffalo drills can lower your cost, too. Write for Catalog 37 describing the complete line.

★

ARMY E NAVY

BUFFALO FORGE COMPANY

388 BROADWAY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

Drilling Machines

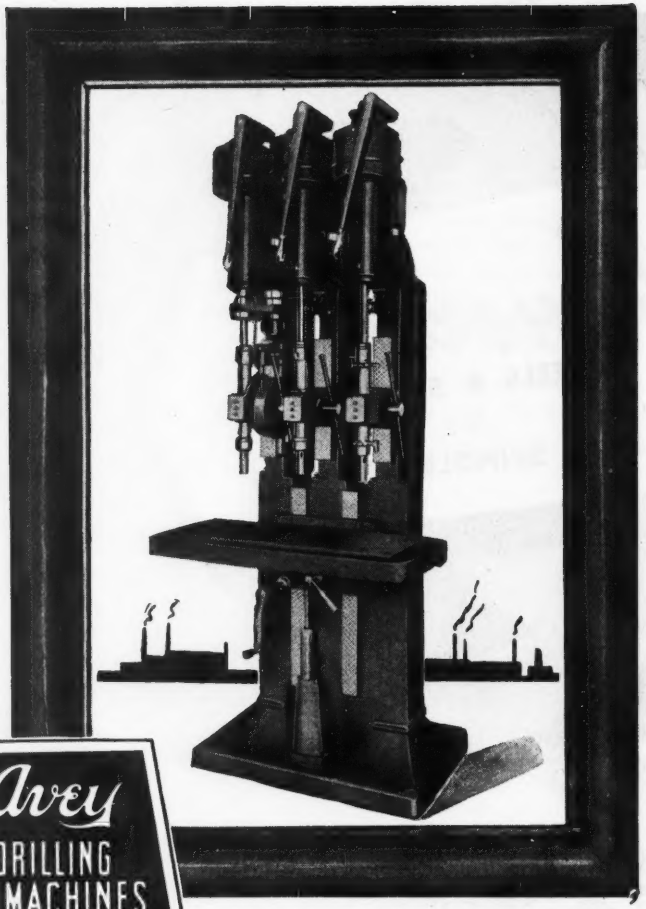


Whatever your preference in vertical spindle grinders, wheels—Hexilinder, Segmented or Plain . . . "American" has developed outstanding cylinder-type ***and various shapes of segments*** . . . to improve production. Typical "American" achievement is the Hexilinder wheel shown above . . . its unique shearing action cuts cool and removes metal *fast.* Write for information.

AMERICAN EMERY WHEEL WORKS

Established 1898

2 RICHMOND SQUARE, PROVIDENCE 1, RHODE ISLAND



Avey DRILLING MACHINES

. . . IN THE PICTURE FOR 1945

Make sure it is in your production line for 1945. Avey Drilling Machines give longer operating hours, smoother performance and lower maintenance. They'll do your war job now, your peace job later. We illustrate the Avey Type MA-6 in No. 2 size (*Capacity in cast iron, 7/8"*). No. 3 size (*Capacity in cast iron, 1 1/4"*). One to six spindle units, either size. Six speed machine, two speed motor, three mechanical changes through gearing, 8 to 1 speed range. Push button control. MA-6 illustrated, has three spindles, the Aveymatic Feed, Hand Feed and Tapper.

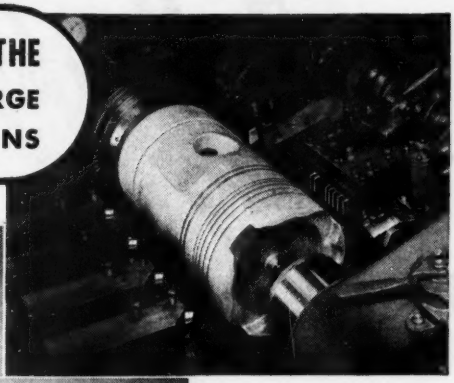
THE AVEY DRILLING MACHINE CO.
Cincinnati, Ohio, U. S. A.

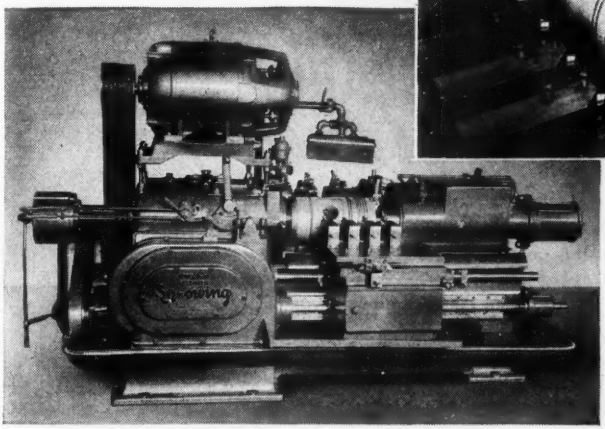
Avey DRILLING MACHINES

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE *Lo-swing* PEOPLE" SENECA FALLS, NEW YORK

Lo-swing MODEL R-14 LATHE EQUIPPED FOR TURNING LARGE SIZE DIESEL MOTOR PISTONS





Above: Close-up view showing tooling.

At left: Front view of machine with belt cover removed to show V-belt drive.

Problem: To automatically turn, groove and face special alloy pistons having a maximum diameter of 10.5".

Solution: The model R-14 Lo-swing was selected for this job due to its rigidity and "Simplified Change-over Mechanism" which permits changing over from one size piston to another in a few minutes by simply making a few adjustments in gear segments which control cross slide movements.

The work is centered on the driven end with an adapter plate machined to fit the bore of the open end of the piston which has been previously machined. This adapter is fitted with a hardened steel driving plate which contacts a lug cast on the inside piston wall, assuring a positive drive. The piston is supported on the tailstock end with a standard 60° revolving type center.

The turning operation consists of machining the outside diameters with four tools mounted on a single cross slide 17" wide. The grooving and facing tools are clamped on two independently operated Back Squaring Attachments, the movements of which are synchronized with the front slide.

The end facing tool is mounted in a special relieving type tool block (see close-up view) which automatically relieves the tool on the return stroke, preventing any scoring or marking of the finished face. The relief mechanism is controlled with a small cam mounted on back attachment cam shaft and may be set to obtain tool relief at any time during the operating cycle.

Sintered carbide tools are used on this job and a high grade finish is obtained on the ring grooves.

LATHE NEWS *from* SENECA FALLS

In One Year....



A Gain of More Than 50%

in sales of LINCOLN PARK *Carboloy* GAGES

THE tremendous increase in the use of Lincoln Park Carboloy gages over the past year clearly indicates the present-day trend toward greater accuracy and economy in inspection operations. This gain is particularly emphasized by the fact that, ever since cemented-carbides were first used in gage manufacture, Lincoln Park has been the largest user of this wear-resistant material for this type of product.

Why are more and more manufacturers rapidly turning to greater use of Lincoln Park Carboloy gages? Here are reasons offered by two manufacturers: "The life of one steel thread plug gage was one 8 hour shift. One of your Carboloy gages has been in use for over 1½ years and is still serviceable" . . . "The average steel gage is good for 5000 pieces. The same gage of Carboloy gives us 250,000 and more." That's real economy in gage costs alone.

Of probably even more importance, Lincoln Park Carboloy gages have made it possible to save thousands of dollars through elimination of the rejection of expensive parts ordinarily inspected with gages made to include allowance for wear. In Lincoln Park Carboloy gages, wear allowance is not necessary. At no time are they "over-size", but are accurate to required limits from the first inspection.

Where *both* money and parts are being saved in inspection, Lincoln Park Carboloy gages are being used.

ARMY (E) NAVY

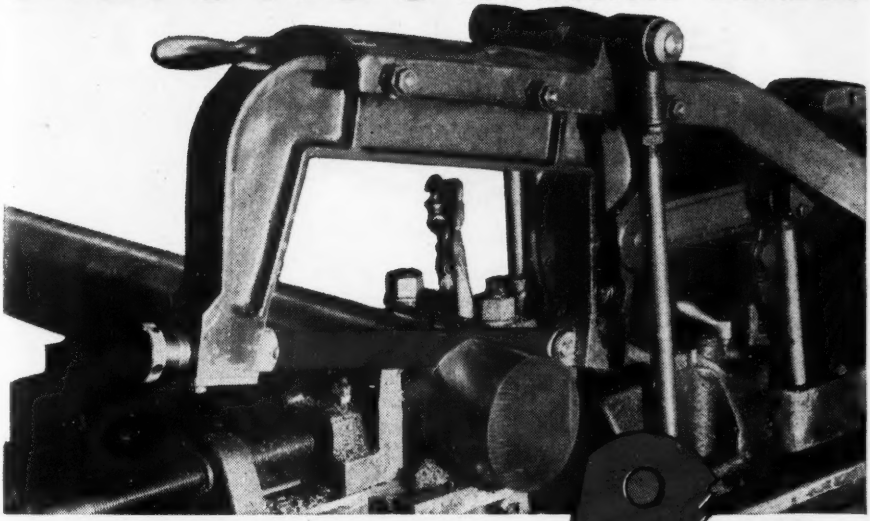
LINCOLN PARK INDUSTRIES, INC.

Successor to The Lincoln Park Tool and Gage Company and Carbur, Inc.

1733 FERRIS AVENUE • LINCOLN PARK 25, MICHIGAN

Get More Cuts Per Hour and More Hours Per Machine with

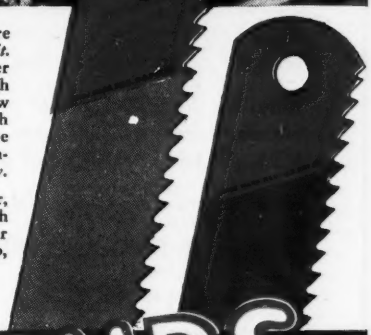
SIMONDS "Red End" HACKSAW BLADES



THESE rugged "Red End" Blades for power-machine use are made to take the toughest service, *and to keep on taking it.* Smoother, straighter cutting . . . higher production . . . longer blade life . . . all these *extras* are now possible through Simonds 100% quality-control, and through Simonds new scientific method of tensioning power hacksaw blades to each particular job on which they are used. "Red End" Blades are made from Simonds own special electric steel, either standard, molybdenum, or high-speed. Order from your dealer *now.*

SEE SIMONDS NEW SOUND FILM, 16 mm in full color, showing how to choose the right "Red End" Blade for each job, and how to get the most out of it *on the job.* Have your dealer arrange to show it to *your* operators, in your own shop, without cost or obligation.

BRANCH OFFICES: 1350 Columbia Rd., Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Ave., Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Wash.



PRODUCTION TOOLS FOR CUTTING METAL, WOOD, PAPER, PLASTICS

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASSACHUSETTS

CUT THE WAR SHORT... BUY WAR BONDS... AND THEN BUY MORE WAR BONDS

"WORKS LIKE MAGIC!"



Knurling the Socket Head of the "UNBRAKO" Cap Screw (left, above) affords a slip-proof grip for oily fingers—and fingers are the handiest of wrenches. Because of this unique knurled head, the "UNBRAKO" can be screwed in faster and farther before a wrench is needed.

Knurling the Cup-Point of the "UNBRAKO" Set Screw (right, above) makes it truly a Self-Locker. No amount of vibration will dislodge it, since the knurls of its point dig in and hold tight.

Sizes in both screws: From No. 4 to 1½" diameter—Full range of lengths.

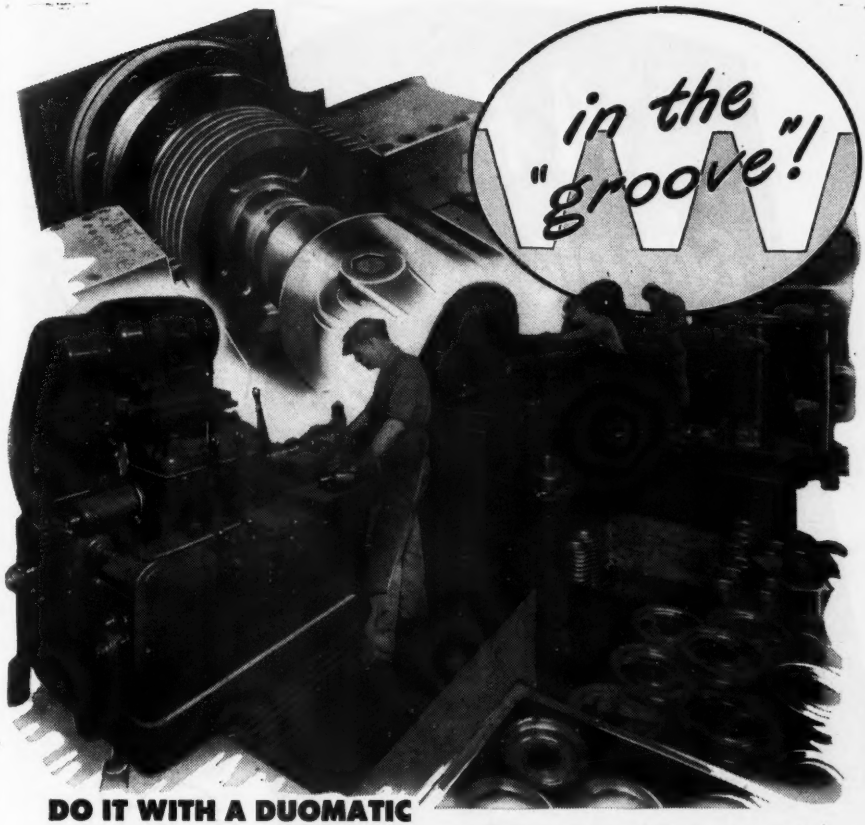
Write for the Catalog of "UNBRAKO" Socket Screw Products.

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA. BOX 556

BOSTON • DETROIT • INDIANAPOLIS • CHICAGO • ST. LOUIS • SAN FRANCISCO

OVER 40 YEARS IN BUSINESS



DO IT WITH A DUOMATIC

Accuracy and uniformity are essential in cutting V-grooves in V-belt sheaves. This assures proper belt seating, equal pull, and maximum transmission of power.

With the Duomatic—Lodge & Shipley's full automatic lathe—you get accuracy and uniformity PLUS exceptional speed in production. For on the Duomatic, dual carriages and tool slides permit far greater multiple tool operations, front and rear... cut many more sheaves at the same time.

Illustrations show L & S Duomatic Lathes in the light duty sheave department of the Dodge Manufacturing Corp., Mishawaka, Indiana. Multiple tools, front and rear, cut 5 V-grooves at one time in Dodge precision-built D-V Sheaves. As groove shapes and pitch diameters must be identical Duomatics are used to meet every precision requirement and to effect outstanding savings in production time.

Call on L & S Engineers to show you how the Duomatic can do a better, faster job on V-belt sheaves. For detailed literature, write on your company letterhead for Bulletin 601.

THE LODGE & SHIPLEY MACHINE TOOL CO.

CINCINNATI 25, OHIO, U. S. A.

L & S LATHES

ENGINE—TOOL ROOM—AUTOMATIC—OIL COUNTRY LATHES

A few simple rules to conserve carbide tools

FIRTHITE FIELD SERVICE POSTERS are available for display in your plant





The conservation of carbide tools through proper handling and correct usage is essential not only in war time but at any time for best production results and low operating costs.

These Firthite field service posters will help remind your plant operators in simple, easy-to-take, understandable manner, of the right way to make carbide tools do their utmost.

Fill in and mail the coupon for your set of these free, 17" x 22", four-color posters.



FIRTHITE

Firth-Sterling

STEEL COMPANY

FIRTH-STERLING STEEL CO.,
Dept. MMS—McKeesport, Pa.

Please send us without obligation on our part_____sets of Firthite Field Service Posters which we wish to display in our plant shops.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

The Right Type of Abrasive for Every Polishing Job...



ALUNDUM "S" ABRASIVE

(Available in sizes 90 and Coarser)

Its special surface treatment give grains with better sticking power but also a faster cutting action—and a cutting action that lasts. Right up to the moment that recoating is necessary you'll find that wheels set up with Alundum "S" Abrasive are still cutting fast.

ALUNDUM "R" ABRASIVE

(Available in sizes 100 to 200 inclusive)

For semi-finishing and finishing operations with polishing wheels using glue as the bond, you'll like the fast cutting action and long life of Alundum "R" Abrasive. It is a grain that will give high production at low cost because it was developed and is processed especially for this type of work.

ALUNDUM "B" ABRASIVE

(Available in All Standard Sizes)

Alundum "B" Abrasive is especially recommended in sizes 100 to 240 inclusive, for polishing jobs using wheels set up with cement. Its cool, free cutting action and long life with this type of adhesive assure economical polishing.

NORTON COMPANY

Worcester 6, Mass.

NORTON ABRASIVES

G-160A



The odds are better than 10,000 to 1 in your favor that you will get the *right tool* when you select a THOR Portable Electric Screw Driver or Nut Setter. Take guess work out of vital assembly operations with THOR Screw Drivers and Nut Setters. Set every screw and nut to a precise, uniform torque-tension—the adjustment is in the tool. *It's impossible to strip threads or over-drive.*

THOR tools assure top speed production in fast-moving assembly lines . . . Today they speed mass production for Victory—tomorrow, they will serve the peacetime needs of the nation. There is a THOR portable tool—electric or pneumatic—for every material or operating condition—available in a complete range of sizes, speeds, torques and capacities.

Write today for copies of THOR pneumatic and electric tool Catalogs.

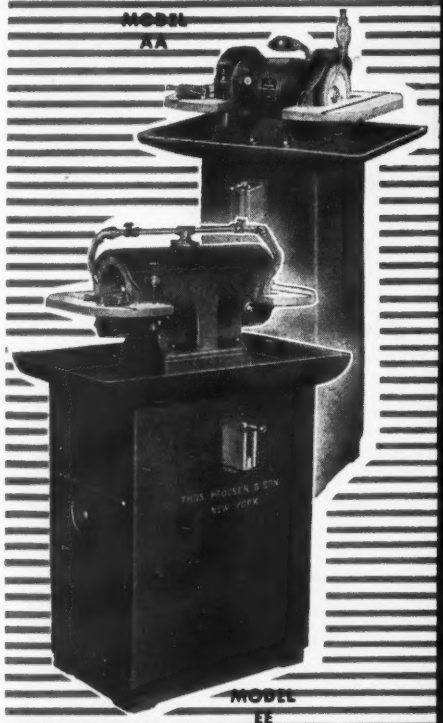
Thor PORTABLE *Electric* TOOLS

Branches in Principal Cities

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Blvd., Chicago 6, Illinois
New York Los Angeles

PROSSER

Carbide Grinders



For fast, efficient rough grinding and fine finishing of carbides, stellite, high speed steel, and other modern tools, install Prosser Carbide Grinders. Their rugged construction, modern design, and ease of operation insure long, dependable and profitable service.

Prosser Carbide Grinders are built in bench and floor models of several capacities, for wet or dry grinding. Attachments for chip breaker and drill grinding.

Important features include:

- **Quick-acting indexing tables.**
- **Adequate wet-grinding equipment.**
- **High grade ball bearing spindles.**
- **Oversize wheels, giving longer wheel life, and permitting grinding of larger tools.**
- **Moderate price.**
- **Prompt deliveries.**

Write for details

Thomas Prosser & Son

120 WALL STREET • NEW YORK 5, N. Y.

MATCHED SETS OF MILLED CHASERS





Note how chaser mounted in a COVEL Precision Vise is adjusted to correct angle for grinding chamfer. Operator uses same setting of grinding machine and vise for remainder of matched set. Vise is Universal Angle Style "A" with 1¼" square capacity, 2¾" jaw width, and is 4¼" high. Work can be mounted in any combination of angles.

Perfectly Sharpened

on COVEL No. 22 UNIVERSAL

Don't take a chance when sharpening matched sets of milled chasers. The COVEL No. 22 Universal Cutter and Tool Grinder does the work in less time and with such a high degree of accuracy that two or a hundred chasers may be used interchangeably in the same die head. This is just another example of the versatility of the COVEL No. 22 Universal.

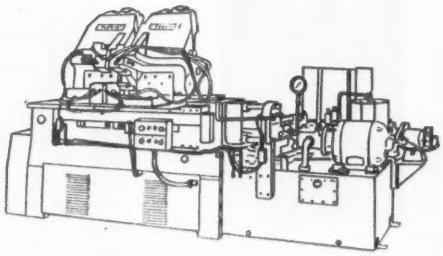
See Your Nearest COVEL Dealer or Write for Bulletin MM-75

GRINDING MACHINERY SINCE 1874

COVEL INDUSTRIAL GRINDERS

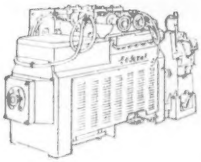
COVEL MFG. CO., BENTON HARBOR, MICHIGAN U. S. A.

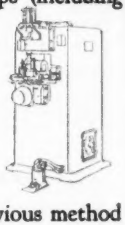
For Fabrication of Metal Resistance Welding Downs Ups Production . . .



The Federal Machine and Welder Company offers the metal working industry increased efficiency in production through resistance welding.

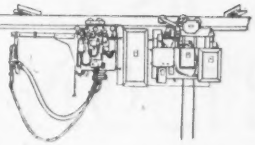
Federal makes all types of resistance welders: for example, heavy duty units typified by the 1000 KVA butt flash welder sketched at right, are made to weld heavy steel rings up to seven feet in diameter. These welders produce high quality forged welds in cross sections up to 18 square inches of high carbon steel, greater areas of mild steel. Similar jobs might be large ring gear blanks, rotating platform bearings, perhaps locomotive tires . . . Sash welders, such as sketched at left, speed production on steel sash of all kinds, are typical of the smaller butt and flash welders adaptable to everything from table knives (stainless welded to mild steel) and tools (high carbons to mild), to all kinds of metal tubing, rods and strips (including copper to aluminum in special instances), with either automatic or hand operation . . . Press type welders, amazingly versatile units for all kinds of projection welding, can be adapted by die changes to an infinite variety of fast assembly of metal parts. One suggested in the right hand corner of this page welds handles to pots and pans of enameling steel (adaptable for aluminum) and in actual production has cut costs to one-fifth that of previous method . . . And, speaking of versatility, one of the most useful tools in metal fabrication is the



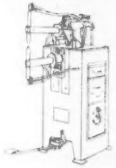


THE FEDERAL MACHINE AND W

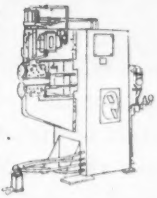
to Metal, Costs...



gun type resistance welder, an example of which is the overhead rail unit which can be rolled up and down an assembly line and allows operator a wide radius of travel about the work (see above)... Spot welders, from small utility rocker arm types (see left) to heavy duty units capable of welding sheets up to ⅜ inch each have wide use in the metal working industry ... Roll spot and seam welders have equally broad application, produce a continuous or intermittent weld, automatically indexed... and many other cost saving types.



Federal wants to make available to you full information on applications of resistance welding to better and faster fabrication. We want to bring you up to date on resistance welding as a tool for modern production. Federal is ready to help if you will tell us WHAT YOU WANT TO KNOW ABOUT RESISTANCE WELDING.



Consult "the name of authority on resistance welding"

Federal

WELDER CO. 218 Dana Street WARREN, OHIO

VERSATILE MODERN PRODUCTION TOOLS

BARREL WELDERS

Of the millions of welded steel drums or barrels used to distribute gasoline and oil to our mechanized war in far corners of the earth, a vast majority are welded on Federal Barrel Welders. Not only has a major percentage of the industry for many years been equipped with Federals, but The Federal Machine and Welder Company designed and built several complete barrel manufacturing plants set up by the army at distant bases to augment the tremendously increased output of the home industry.

Seam welds (resistance welded) in such containers must be able to take terrific punishment. Immediately after welding, the barrel shells pass through a machine which forms two rolling rings in the side, by stretching the steel outwardly under great pressure. Then, too, the loaded barrels, weighing over four hundred pounds, often are dropped a distance that subjects them to thousands of pounds impact. The weld must hold.

NEW FOLDERS

Most recent informative bulletins on Federal Resistance Welders to come from the press are the new "Type R" bulletin describing a complete line of rocker arm utility spot welders .. and "Type P" Bulletin with details of Federal's Press Welders, used for projection welding, mash welding, etc. Bulletins are available now on request.

HOUSEWARE PRODUCTION

Anticipated expansion of houseware production points up the advantages of Federal resistance welding for the fast, low cost application of handles to enameling steel or aluminum pots and pans. Press type welders are used, with dies that permit rapid loading, give production of 500 to 800 handles per hour, depending upon type of handle applied. Cost with one manufacturer is one-fifth previous methods.

INTERESTING PLANT

Full details of a complete manufacturing plant for high production of large resistance welded tank turret rings (up to seven feet OD) are in a book just released by The Federal Machine and Welder Company. The company designed and built the entire plant, shipped to a foreign power. Point of interest is that similar rings, which can be made with same equipment, could be used for large ring gear blanks, rotating table bearings, possibly locomotive tires. Limited number available to executives, technical men, sufficiently interested to write to Federal giving name, official title and company name.

"DON'T PLAY WITH IT"

IT'S A

ROBERTSON COOL-CUT

The foreman of the grinding department of a big, ordnance plant stared at the Robertson sales engineer in amazement. The foreman had been trying to take a .0001″ cut off Airdie steel, Rockwell 68. The wheel he was using was getting nowhere. The Robertson sales engineer put on a Cool-Cut wheel and said, "Now don't *play* with it—take off .020″ depth, with .020″ cross-feed."

He tried it, and it worked! The Cool-Cut wheel took the metal off without heating the work and with no measurable wheel-loss. Chip-clearance of this revolutionary new wheel made it possible. The foreman said he'd never seen anything like it in his 45 years of experience. Now he knows that the Robertson sales engineer knew what he was talking about and that Cool-Cut wheels are precision-built for the *toughest* work. Fifty years of experience in the operation of high-temperature furnaces gives Robertson the know-how that makes them one of the most progressive grinding wheel manufacturers today, and assures them an increasingly important place in the field of industrial grinding.

VITRIFIED-BONDED GRINDING WHEELS
MOUNTED WHEELS • SEGMENTS



FREE—Write for this new booklet, "How to Buy Production-Time." It contains facts about grinding wheels you never knew before!



ROBERTSON MANUFACTURING COMPANY

TRENTON 5, NEW JERSEY

OLIVER of Adrian Die Making Machines

WILL SAVE YOU 50% TO 60% OVER

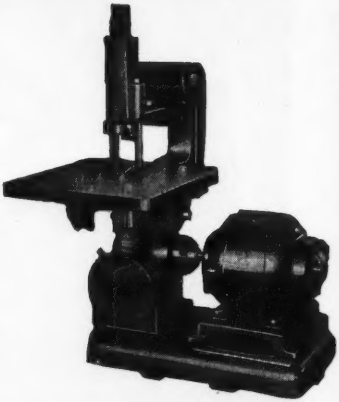
hand methods on your DIES, GAGES, Cams, Templates, Experimental Work, etc.

• • • •

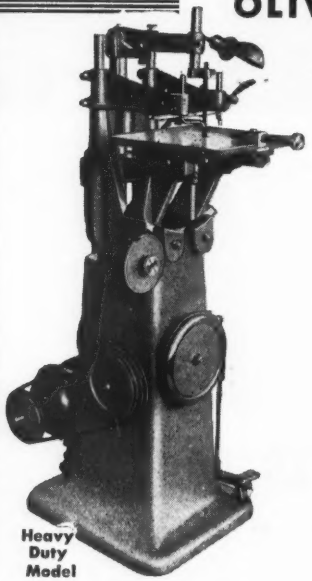
Avoid obsolete methods and cheap substitutes. The Original Oliver is priced within the reach of all.

• • • •

Cut illustrates S-1 for 1" materials. Efficient on all Sawing, Filing and Lapping Operations. (Prices as low as $125.)



OLIVER OF ADRIAN



Heavy Duty Model

The Heavy Duty Model illustrated is a pedestal machine for 3" materials. It is equipped with adjustable stroke device — variable speeds — 14" table — hydraulic feeding device — foot operated clutch — light fixture.
A tried and proven machine that will enable you to produce both large and small die work at a fraction of the cost.

• • • •

When in need of Die Making Equipment — Remember Oliver of Adrian — A model for every purpose. Files, saws and lapping sticks in stock for use with all models.

• • • •

OLIVER INSTRUMENT COMPANY

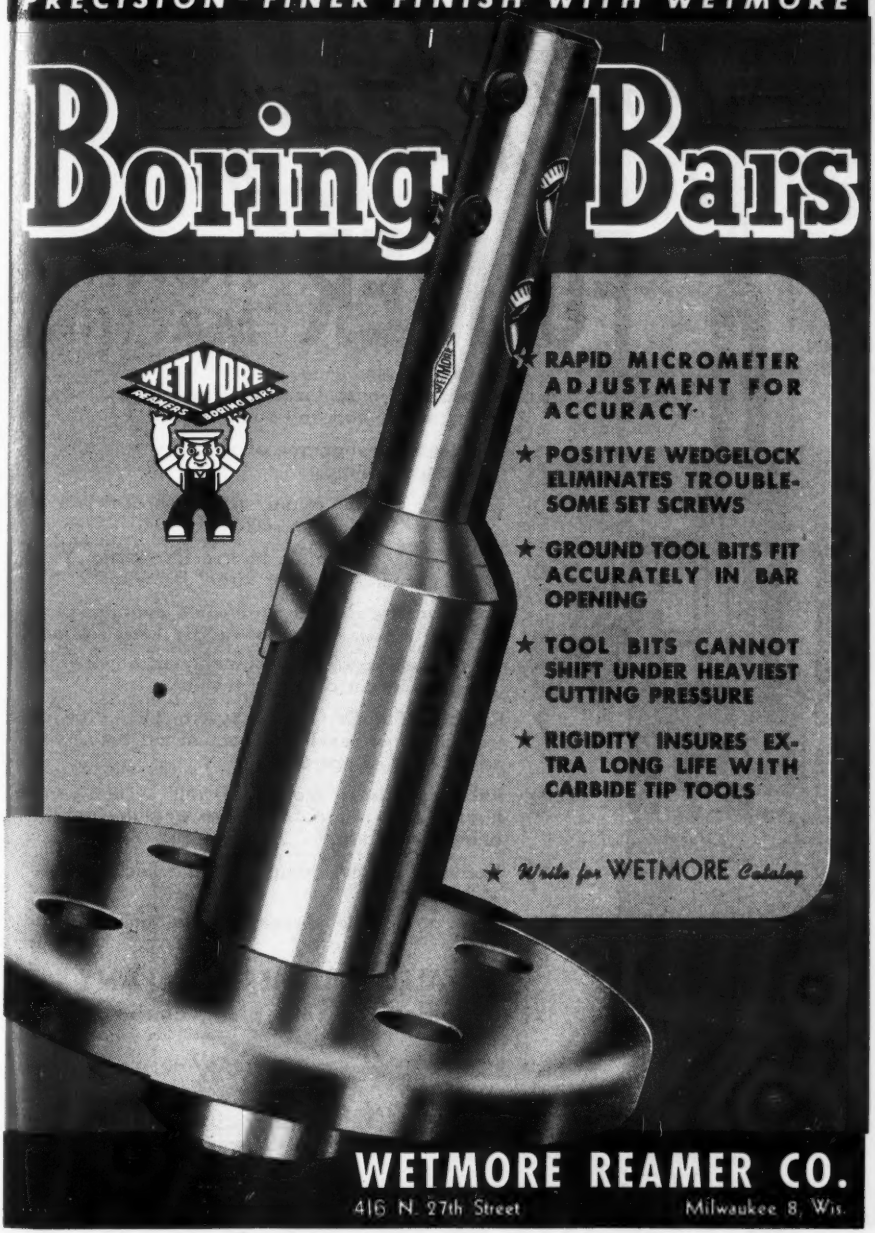
1430 E. Maumee St. **Adrian, Mich.**

We also build Drill Grinders, Tool and Cutter Grinders, Face Mill Grinders, Template Tool Bit Grinders.

Let us send bulletins, giving full information on Oliver die making machine. Prompt deliveries offered.

PRECISION - FINER FINISH WITH WETMORE

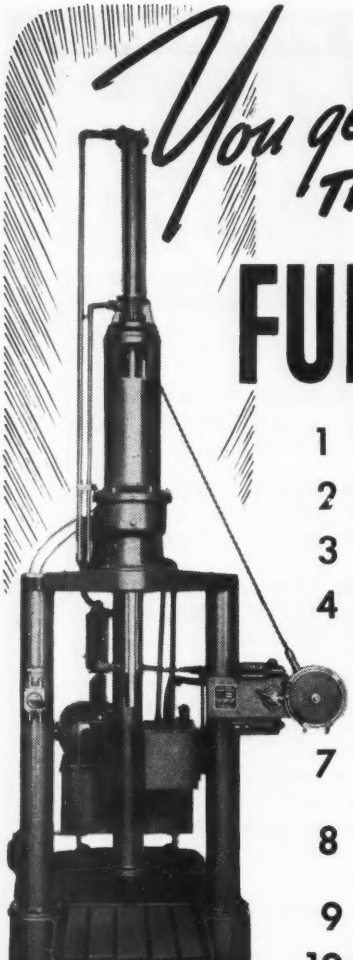
Boring Bars



WETMORE REAMER CO.

416 N. 27th Street Milwaukee 8, Wis.

You get ALL THESE ADVANTAGES in the FULMER HONING MACHINE



1. It finishes aircraft, Diesel, gas and compressor cylinders faster than any other method.
2. Assures highest degree of accuracy with any surface finish desired.
3. Produces straight, round, smooth bores to working tolerances as close as .0002".
4. Wide range of spindle and reciprocating speeds permits honing small or large diameters.
5. Oversize capacity gears and bearings permit continuous operation under heaviest loads.
6. Simple to operate. Inexperienced operators can obtain precision results.
7. Patented Fulmer Control System places all controls at "floor level", in front of machine, within easy reach of operator.
8. Patented Fulmer "Stop and Dwell" system permits honing up to internal shoulders or to the head end of blind cylinders.
9. Exclusive Fulmer Sump System collects over 90% of the sludge.
10. Uses any make of conventional honing heads.

C. ALLEN FULMER COMPANY

1233 First National Bank Bldg., Cincinnati, Ohio

FULMER PRECISION SERVICE EQUIPMENT

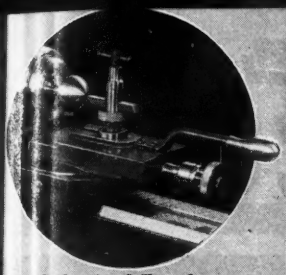
PISTON RING LAPPERS
SPECIAL MACHINERY
HONING MACHINES
ROD BORERS

DEALERS: *A few attractive territories remain open. Write today!*

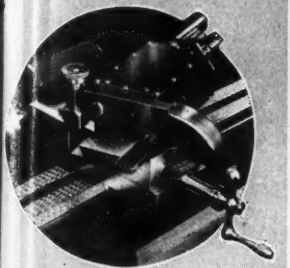
918 PLAIN CABINET LATHE

For

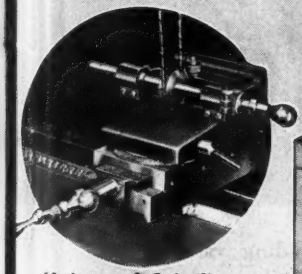
Tool-room — Assembly — Production



Spherical Turning



Automatic Turning



Universal Grinding

The Rivett No. 918 plain cabinet lathe is a versatile machine capable of many operations. In addition to the normal lathe functions of turning, facing, boring and drilling, the 918 can be equipped for milling, grinding, slotting and thread chasing.

The operating conveniences and design features assure efficiency on any operation. Work can be quickly gripped in collet or step chuck or mounted on centers or face plate. Selected spindle speeds are controlled by single lever. Built-in accuracy, correct spindle speed and dynamic balance guarantee finish to closest tolerance.

The machining capacity and producing efficiency of the 918 plain cabinet lathe open many opportunities for its use in the tool-room, assembly and production departments.

Write for bulletin.



SPECIFICATIONS

wing over bed, dia.	9"
istance between centers	18"
ollet capacity, max. dia.	1"
ep chuck capacity, max. dia.	6"
w chuck capacity, max. dia.	6"
indle capacity, max. dia.	1⅛"
ide rest, travel of tool post slide	5¼"
ide rest, travel of cross slide	5¼"
ilstock spindle travel	3½"
indle speeds, eight forward and reverse.	
Low range	150-2500 r.p.m.
High range	225-3750 r.p.m.
eight of lathe, mounting and drive,	net 850 lbs.

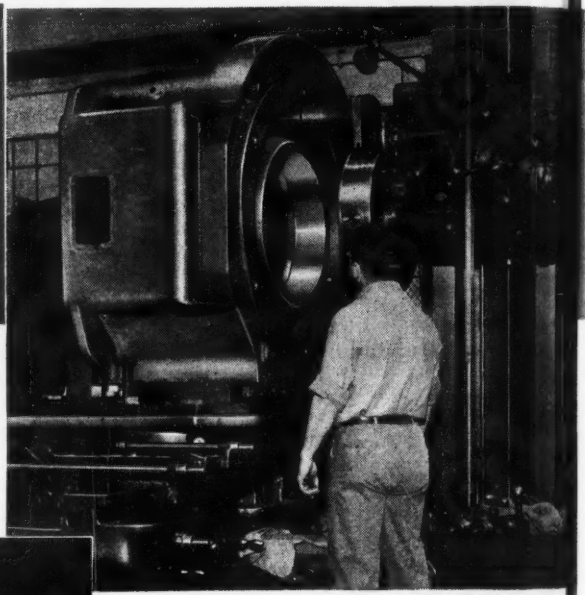
RIVETT

RIVETT LATHE & GRINDER, Inc.

BRIGHTON • BOSTON • MASS. • U. S. A.

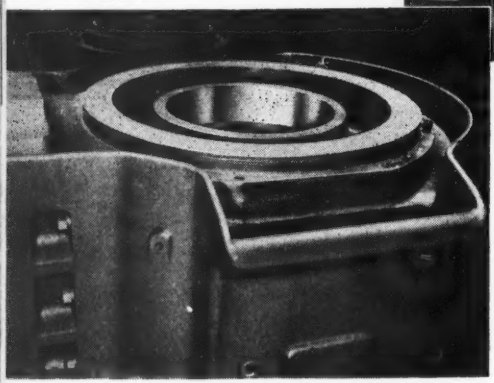
THESE LARGE BORES

● G. & L. Horizontal Boring Machine Produces Work to Precision Limits...Scales and Verniers Locate Bores While Continuous Feed Facing Head Gauges Machined Diameters



(At right) Standard G. & L. Machine with Continuous Feed Facing Head and Rotary Table used for toolroom work. Note simplicity of mounting machine base and saddle assembly on rotary table.

(Below) Close-up of machine saddle shows 24", 38⅞" and 50° taper bores.



● Are you spending valuable man hours unnecessarily in laying out work before machining and in checking work dimensions during the machining cycle? A large midwest manufacturer eliminates work layout and saves checking time when boring this special saddle by using a standard G. & L. Horizontal Boring, Drilling and Milling Machine with standard accessories. This means the workpiece is taken directly to the G. & L. without first locating the bore diameters. Machine scales and verniers

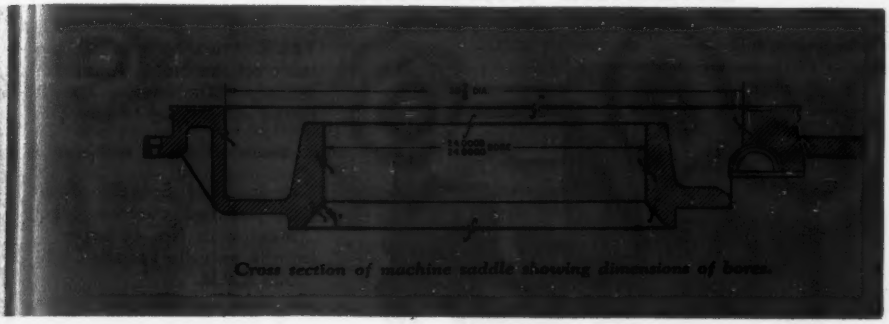
G&L



GIDDINGS & LEWIS

146 DOTY STREET FOND

HELD TO .0005"



Cross section of machine saddle showing dimensions of bores.

are used to accurately determine saddle position for precision boring. After machining cuts are started, the micrometer adjustment of the Continuous Feed Facing Head is relied upon to measure all semi-finish cuts. However, final .0005" measurements are made with micrometers. This procedure saves many hours in layout and checking.

Telescopic type tool holders are used on the Continuous Feed Facing Head to bore the inner 24" and outer 38⅞" diameters. The 50° taper bore shown through the 24" opening is made with a special taper boring tool used with the Continuous Feed Facing Head. The machine saddle is mounted on a standard power driven rotary table and after the bores are completed, the work is rotated for subsequent machining operations.

Manufacturing Costs Reduced... Production Increased

This is another example of the built-in accuracy of the Giddings & Lewis Horizontal Boring, Drilling and Milling Machine. In your own plant you may be spending valuable man hours on unnecessary layout and work checking which could be handled easily and simply on the G. & L. Machine. If you wish to lower your manufacturing costs and increase production, our engineers will gladly study your machining problems. Recommendations showing how savings can be made will be submitted to you without obligation.

Additional Data...

...complete information available on Giddings & Lewis Machines, accessories and time-saving attachments. Write for Bulletin No. MM-75 today. Please indicate business connection.

MACHINE TOOL COMPANY

REET FOND DU LAC, WIS.

GET THE FACTS:

on AMERICAN No. 2 MILLING MACHINES

(UNIVERSAL AND PLAIN)



Illustrated above is the No. 2 American Universal Milling Machine. Note the conveniently located speed and feed changes, push button control and clutch lever, adding to ease of operation.

You'll want to get all the facts on the No. 2 American Milling Machines. They'll prove interesting to you.

Some of them include:

Standardized Spindle Nose.
Heat treated chrome-nickel steel with No. 40 taper.
Infinite spindle speeds 25 to 500 R.P.M.
Motor in Base Drive.
U. S. Vari-Drive motor. Twin Disc Duplex Machine Tool Clutch.
Heavy Rugged Construction.
Heavily proportioned column houses motor drive and power shafts.
Working surface and overall size of table, 46" x 10½". Longitudinal range, 25". Transverse, 9". Vertical, 19". 16 geared feeds.



Write for Bulletin giving complete information and specifications. No obligation.

J. L. LUCAS & SON, INC.

MACHINE TOOLS

BRIDGEPORT 5 **CONNECTICUT**

No matter how tough the job, there's a

KRW HYDRAULIC PRESS

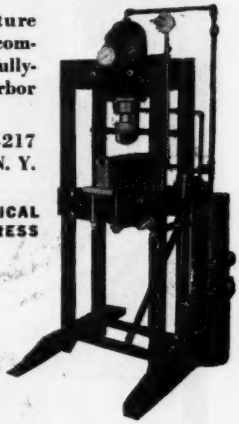
that can do it CHEAPER and BETTER

Illustrated are a few of the many adaptations of the famous KRW Hydraulic Press which is doing a variety of pressing, forming, bending, straightening and closing operations for industry.

KRW Presses are adaptable to literally hundreds of special jobs. Using low-cost dies, manufacturing costs on many items are greatly reduced. Using air pressure varying from 100 to 225 pounds, the resulting hydraulic pressure varies with the air pressure used. A built-in air regulator permits exact duplication of pressure on every stroke . . . this is important on many operations. KRW Hydraulic Arbor Presses are available for either vertical or horizontal operation or specially built to handle a particular operation.

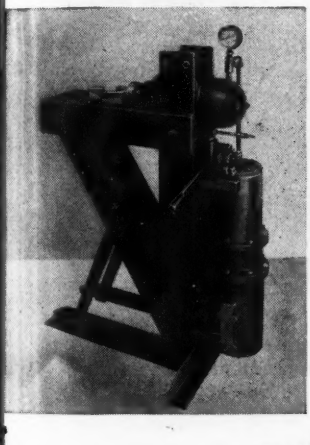
We also manufacture suitable capacity air compressors. Write for fully-illustrated Hydraulic Arbor Bulletin.

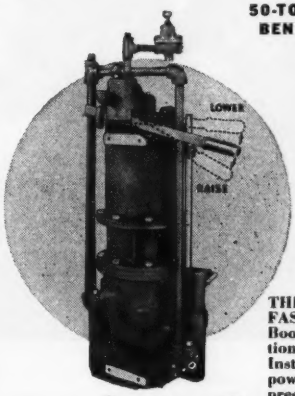
K. R. WILSON, 215-217 Main St., Buffalo 3, N. Y.



50-TON VERTICAL BENDING PRESS

SPECIAL FORMING AND BENDING



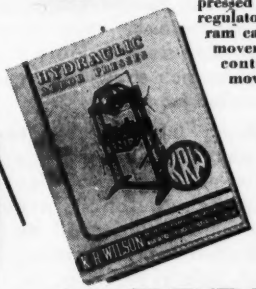


THE KRW SPEEDI-BOOSTER

THE REASON WHY KRW PRESSES ARE FAST AND ACCURATE. The KRW Speedi-Booster eliminates the need for the conventional type Capstan wheel or pumping lever. Instead, it uses compressed air as the motive power operating the ram. Because the compressed air is controllable through a pressure regulator, any desired tonnage pressure at the ram can be obtained and duplicated. Ram movement (up, down or stop) is instantly controlled with the slightest fingertip movement of the lever.



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full of valuable data

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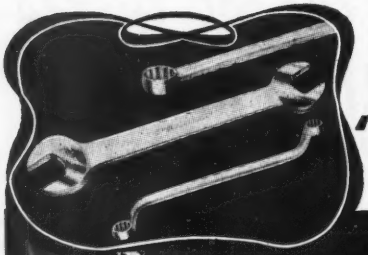
K. R. WILSON 215-217 Main St., Buffalo 3, N.Y.[16]
Please mail me a copy of your Hydraulic Press Catalog.

Name.....

Address.....

City..... ..... *State*.....

K. R. WILSON
BUFFALO 3, NEW YORK



They're easier to reach with

"SUPERRENCHES"



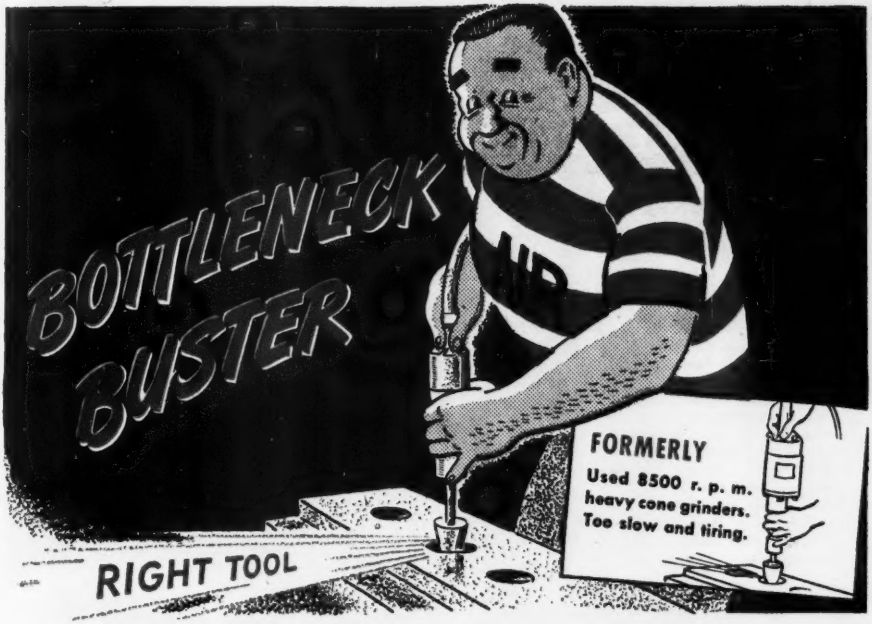


Awkward, hard-to-reach adjustments present no problem for these slim, taper-jawed "Superrenches". Forged from alloy steel, they are thin enough to operate half nuts yet their strength is equal to that of the strongest wrenches made.

Williams "Superrenches" are available in a wide range of patterns, with openings from 3/16" to 3-1/8". When wartime regulations are lifted they again will be furnished in bright chrome finish. Sold by Industrial Distributors everywhere. J. H. Williams & Co., Buffalo 7, N.Y.

WILLIAMS

DROP-FORGINGS AND DROP-FORGED TOOLS



30% MORE PRODUCTION WITH THIS 3¾ LB. GRINDER

MEN of this cleaning room thought they had 'em all—grinders with 6" straight wheels, 6" flared cup wheels and 2¼" cone wheels. Still, the cleaning of ports in engine blocks was a bottleneck. Their 8500 r.p.m. cone grinders were too slow and tiring.

"Break the bottleneck with 17,000 r.p.m. Rotor Die Grinders," suggested the Rotor Application Engineer. These 3¼ lb. tools with 1¼" x 2¼" x ½" cone wheels went to work and produced these results:

30% faster grinding of ports because of higher speed.

Less fatigue because the light-weight tools were easy to move from port to port.

Versatile... adaptable also to 2½" x ⅜" x ⅛" straight wheels for other tight spots.

Perhaps the Rotor Application Engineer can discover savings like these in *your* shop. The services of this portable tool expert are yours for the asking.

Yours for more production,

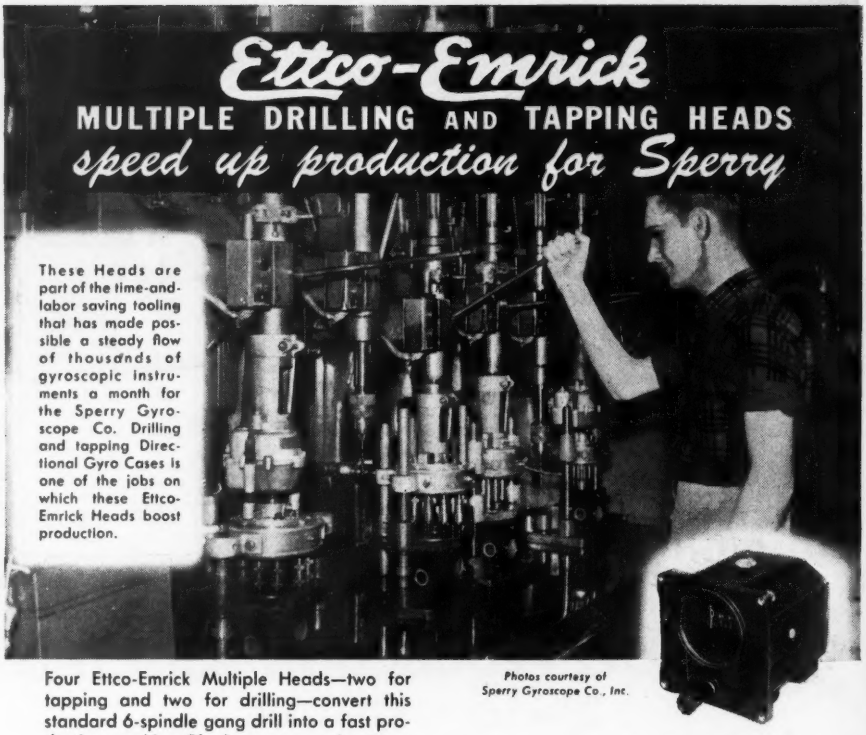
AIR O'TOOL



THE ROTOR TOOL CO.
CLEVELAND OHIO

Ettco-Emrick

MULTIPLE DRILLING AND TAPPING HEADS *speed up production for Sperry*



These Heads are part of the time-and-labor saving tooling that has made possible a steady flow of thousands of gyroscopic instruments a month for the Sperry Gyroscope Co. Drilling and tapping Directional Gyro Cases is one of the jobs on which these Ettco-Emrick Heads boost production.

Photos courtesy of Sperry Gyroscope Co., Inc.

Four Ettco-Emrick Multiple Heads—two for tapping and two for drilling—convert this standard 6-spindle gang drill into a fast production machine. Blank cases come in at one end and go out the other, with the Multiple Heads doing the following operations in sequence. 1st Head drills 9 No. 33 holes. 2nd Head taps 6 holes for #6-40 screws—3rd Head drills 4 No. 33 holes and 2 No. 43 holes —4th Head taps 4 holes for #6-40 screws and 2 for #4-40 screws. The two spindles with single drills are used for deburring and countersinking between drill and tap operations.

Tied in with each Head is an Ettco-Emrick fixture which automatically positions and clamps the cases, facilitating and speeding up the progressive flow from one operation to the next.

As compared with the older single-spindle method of doing such work, these Multiple Heads greatly increase output with savings in man-hours and machine-hours that quickly return their cost.

[illegible] PRODUCTION AT MINIMUM COST ON SMALL PARTS DRILLING AND TAPPING

Consult **ETTCO . . .**

Send drawing or sample part for Multiple Head recommendations. For more information write for the "Multiple Head Reprints".

ETTCO TOOL CO.

598 Johnson Ave., Brooklyn 6, N. Y.
Detroit 1 *Chicago 6*

Over 25 years specialization in solving industrial drilling and tapping problems

GORTON

SPECIALISTS FOR OVER 50 YEARS IN

Tracer-Controlled MILLING



Automatic *Rotation PROFILING

*WORK and MASTER ROTATE with TABLE MOVEMENT

CYLINDRICAL Interrupter Cam for Gun-Fire Control

A Typical HIGH PRODUCTION Profiling Job—done on the Gorton 9-J Duplicator. 10 elliptical wells—no two the same size—on each of these cylindrical work pieces are rough and finish milled, with beveled edges—simply by combination of Tracer Control, with Automatic Rotation of work and master, geared to table movement—all controlled by one central lever motion.

Blank cylinders come to the Gorton Duplicator, finish-turned. The 10 wells are first rough milled to a depth of .052". Then a finish cut, with the same cutter and spindle speed, removes .010" stock, merely by lowering spindle the required amount. Hand finishing required is almost negligible—due to the excellent finish obtained by the use of 2-flute Tungsten Carbide form cutters—at Gorton high spindle speeds.

PRODUCTION DATA

Material—S.A.E. 1020 Seamless Steel Tubing.
Operation—Rough and Finish Milling of 10 Wells (varying from ¾" wide x ⅜" long to 3⅝" wide x 2" long), .062" deep.
Cylinders—9⁹⁄₁₆" O.D. x 7²⁵⁄₃₂" long.
Feed—Manual Spindle Speed—4,000 r.p.m.
Tolerances—±.005"
Time—Roughing 18 minutes; finishing 23 minutes; total floor-to-floor, 43 minutes. (10 wells complete, average 4.3 min. per well.)

ENGINEERING SERVICE . . . FREE

Have the advantage of 50 years of Gorton Specialized Tracer Control Experience in your shop—call nearest Gorton dealer or write to Gorton factory at Racine, Wisconsin.

The Right Size The Right Type of Machine for Every Job . . . From 2 oz. to 5 ton DIE BLOCKS



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CUTTER GRINDERS | ETCHING MACHINES | 2 & 3 Dimensional PANTOGRAPHS | Vertical & Universal Head Super-Speed MILLERS | Manual & Electric Control DUPLICATORS

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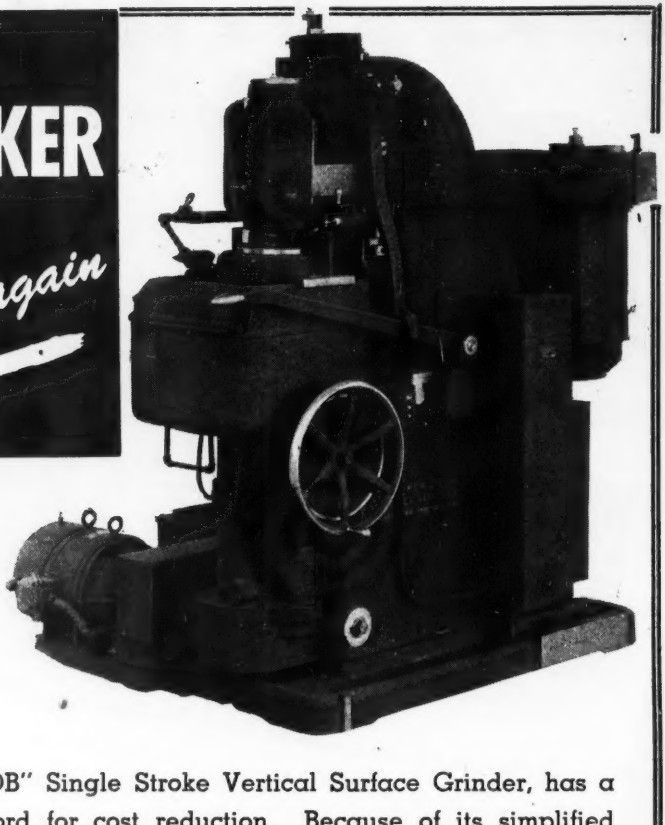
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WALKER

does it again

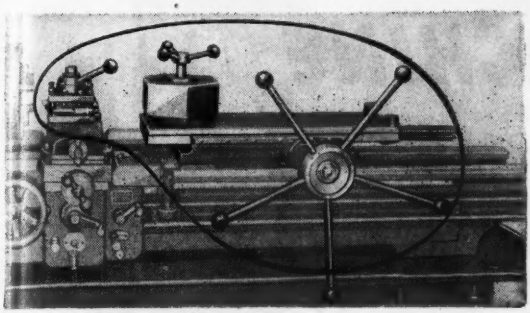


Walker's "DB" Single Stroke Vertical Surface Grinder, has a proven record for cost reduction. Because of its simplified design, the operation of this machine is readily mastered by inexperienced operators. The machine has a 12" Rotary Walker electric magnetic chuck and may be adjusted 8° to grind concave or convex. Write for our catalogs illustrating our complete line of Grinders and Electric and Permanent Chucks.

O. S. Walker Co., Inc.

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LYNN "Puts Lathes Back on Their Feet"



Now you can put your idle or unproductive lathes back into profitable production at once. No delays, no tedious overhauling, no large capital investment . . . LYNN provides complete equipment for reconditioning or converting your *present* lathes—gives you the equivalent of NEW TURRET LATHES in capacity, accuracy, speed and range of work.

Reconditions Turret Lathes

Your worn or inaccurate turret lathes and screw machines can be expertly re-conditioned without leaving your plant or interrupting production. Simply use LYNN units as replacements. The illustration above shows a turret lathe that has been reconditioned with LYNN equipment, including Self-Indexing Bed Turret. Quick mounting and perfect alignment is assured because turret bases are *machined at factory to fit your particular make of lathe.* LYNN manufactures a complete line of bed turrets—in addition to tool post turrets, cross slides and other equipment—for every make and size of standard lathe.

Converts Engine Lathes for Turret Work

The practical economical solution for short-run production. Easily, quickly, mounted, LYNN turret units enable your lathes to handle multiple operations comparable to those done on turret lathes and screw machines—eliminating time-consuming and expensive tooling up.

Tested and proven in exacting war production throughout the nation . . . LYNN equipment may very well provide the answer to your particular production problem.

Write for complete story today—or consult your jobber.



LYNN Lathe Legs and Splash Pans.

Equip your lathes with proper coolants for fast-cutting tools. We supply the above Splash Pan of 16-gauge steel and Lathe Legs of ¼-inch steel plate. *Prompt delivery.*

Inquire also about our new model tool post turret with special double-locking feature and adjustment for wear.

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A FLEXIBLE TAPPING MACHINE

Handles a Wide Range of Jobs

In these quick-changing times a truly UNIVERSAL low-cost tapping machine is a real asset. The Procunier unit here illustrated, by interchanging two tapping heads will handle from a No. 2 tap up to a 5/16" tap in steel, ⅜" in cast iron and ½" in brass and aluminum. That means that in your shops one Procunier can do the work of two or more machines.

In addition, all adjustments can be made quickly and easily—such as regulating compensating spring pressure, setting depth stop, changing to any of the four speeds from 390 to 2050 RPM, or adjusting timing or flow of tap lubricant. Extra long compensating springs assure uniform tapping and reversing pressure independent of operator. Tap establishes its own lead for greater accuracy. Automatic tap lubricator provides abundant supply exactly when needeed. Motor-driven continuous flow lubricant pumps also available. Has exclusive Procunier high-speed tapping head with double-cone friction clutch and TRU-GRIP tap holder which has many advantages. Many other features.



Prompt Delivery — Send for Bulletin

giving full details and prices on Procunier Universal Tapping Machines, High Speed Tapping Head and Tru-Grip Tap Holder.

PROCUNIER

For Faster, More Accurate Tapping

THE PROCUNIER SAFETY CHUCK CO.,
12 S. Clinton St., Chicago 6

Send me bulletins on: ☐ Universal Tapping Machines, ☐ High Speed Tapping Heads, ☐ Tru-Grip Tap Holders.

Name.....

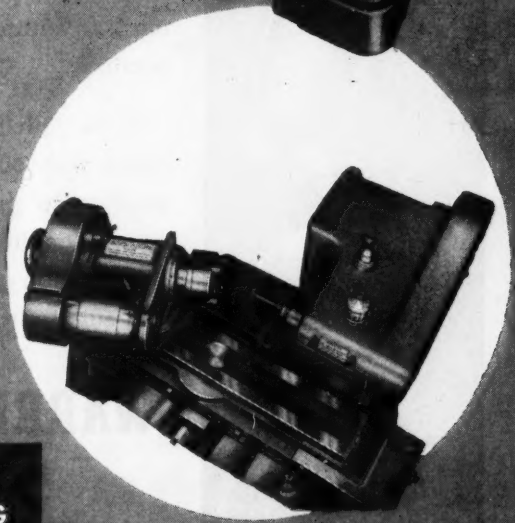
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FEATURES

- Infinitely Variable Longitudinal Traverse
- Hydraulic Cross Feed
- Coolant
- Precision Spindles
- Heads Swivel For Angle Work
- Grinding Heads To Convert For Internal Grinding (See Cut)

EG103 SPECIFICATIONS

Work Capacity—3" Dia. x 10" Length
Workhead Accommodates—Collets 1" Max. Hole
—Chucks & Face Plates 4" Max.
Floor Space & Wt. 45" Long x 25 Wide—1600 lbs.

THE GRENBY MANUFACTURING COMPANY

PLAINVILLE, CONNECTICUT

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Can Warren Industries make both our special cutting tools and gages?

The answer is yes — we can make your gages—of the more difficult types—with the same precise accuracy and workmanship that have brought us our reputation for making fine cutting tools to blue prints or specifications.

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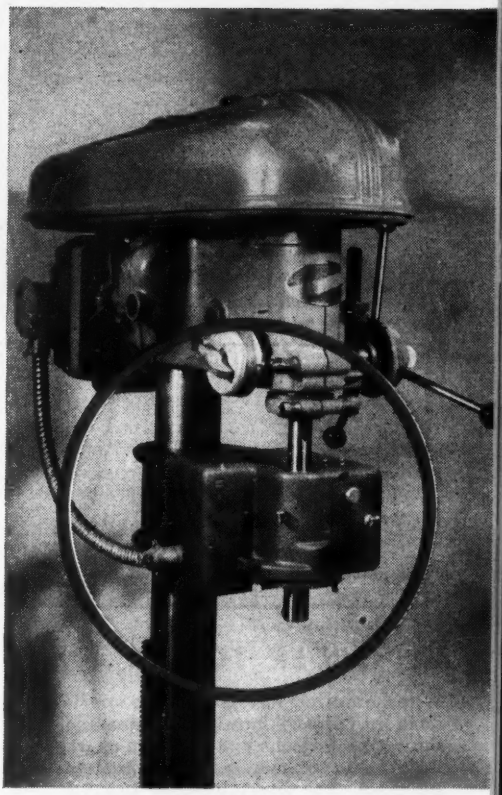
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on your own drill press

with unskilled labor

Class III threads — consistently! The Rotorex attaches to your drill press in ½ hour. Changeovers, tapping or drilling, 5 minutes. Controlled lead assures precision. Includes fast control for tapping or drilling.

ROTOREX requires little more vertical space than a tapping chuck — yet gives accurate tapping in a wide range of sizes. It makes drilling and tapping possible on a single press unit, or, installed on one or more units of gang drills, allows continuous line production from drilling through tapping. Economical, easy to operate and rugged, it will help solve your tapping problem. Send for free booklet and complete details.



CHECK THESE FEATURES:

1. Positive, automatic control of lead.
2. Hardened, precision ground lead screws.
3. Instantaneous emergency reverse.
4. Complete automatic cycle.
5. Accurate control of depth — accuracy to .010.
6. Foot control frees operator's hands for loading.
7. Capacity 0-80 to ⅞".
8. Price complete, $175.00, F. O. B. factory (May be purchased on your MRO rating).

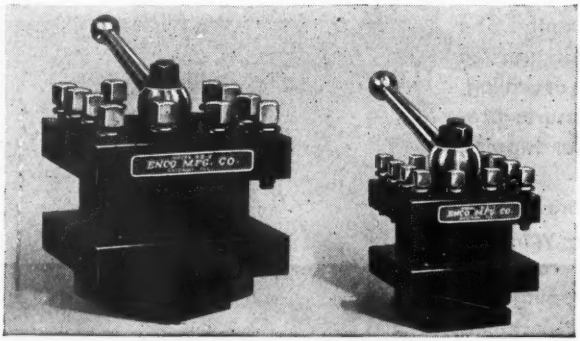
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DOUGLAS ROTOREX PRECISION TAPPER

DOUGLAS MACHINERY CO., INC., 142 BROADWAY, NEW YORK 7, N. Y.

For that BIG Lathe job . . . . .
get 12 station indexing
plus HEAVY DUTY construction

Each tool indexes to three different working positions on the ENCO Heavy Duty Turret. Three stations — 30°—60° and 90° for each of the four tools mounted mean less tool grinding and fewer special tools. One tool can be used for facing, turning and chamfering. Also threading tools are quickly indexed into position — square with the work while the compound is set at 30°. Enco's 12 stations at 30° each see to that.
Minimum tool overhang and hardened steel construction permit "hogging it off" at high speeds. Enco combines rigidity and strength with maximum flexibility to help you cut lathe time and cost on that big job.



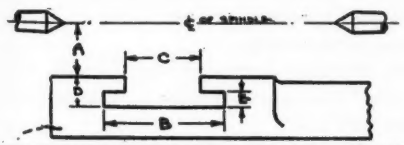
IMMEDIATE DELIVERY

All models can be shipped from stock with machinable base which can quickly be adapted to your lathe. One week required for turrets fitted to specifications.

Turret Specifications	Model HD-4	Model HD-3	Model HD-2	Model HD-1
Size of Turret Block	7½" square 4¾" thick Mac-it Tool Post Screws	6½" square 4½" thick Mac-it Tool Post Screws	6½" square 4¼" thick Mac-it Tool Post Screws	4½" square 3" thick Mac-it Tool Post Screws
Tool Size Range	1¼" to 2" or No. 5 toolholder for ⅝" bits	1½" to 1¾" or No. 4 toolholder for ½" bits	1" to 1½" or No. 4 toolholder for ½" square bits	¾" to 1"
"A" Dimension Range	3" to 3⅝"	2¾" to 3⅜"	2½" to 3⅛"	1⅝" to 2½"
Shipping Weight **Price**	89 pounds **$190.00**	66 pounds **$150.00**	60 pounds **$130.00**	20 pounds **$99.00**

ORDER TODAY

When ordering turrets made to specifications please furnish dimensions shown on the lathe specification chart. Be sure to specify maximum tool to be used. For special center heights write for quotations and recommendation.



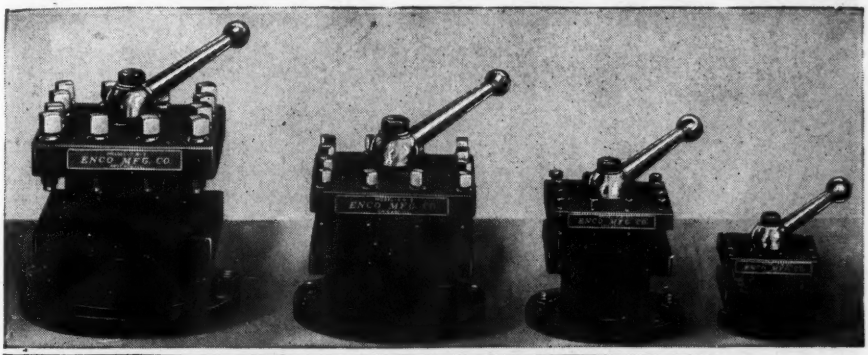
Make of Lathe and Size	A	B	C	D	E	Maximum tool size desired

Enco TURRET TOOL POSTS

July, 1945

Extreme RIGIDITY

under heavy cuts



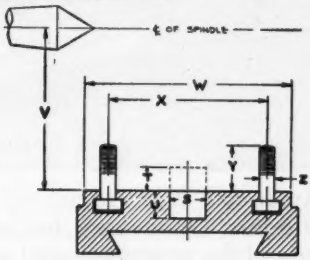
MODEL	CR-7	CR-6	CR-4½	CR-3½
MAXIMUM TOOL SIZE	Up to 1¾" tool or No. 4 Tool holder for ½" sq. bit	Up to 1¼" tool or No. 2 Tool holder for ⅜" sq. bit	Up to ¾" tool or ⅜"x¾" Tool holder for ¼" sq. bit	Up to ½" Tool
SUGGESTED LATHE SWING	22" to 36"	16" to 24"	13" to 17"	9" to 14"
SIZE OF TURRET BLOCK	4¼" thick 6½" sq.	3" thick 6" square	2¼" thick 4½" sq.	1¾" thick 3½" sq.
SPECIFICATIONS	4 Tool 12 position packed in crate. Shipping Wt. 80 lb. **Price $160.00**	4 Tool 12 position packed in crate Shipping Wt. 50 lb. **Price $129.00**	4 Tool 12 position packed in crate. Shipping Wt. 25 lb. **Price $79.50**	4 Tool 12 position packed in carton. Shipping Wt. 12 lb. **Price $55.00**

DELIVERY ONLY 5 DAYS AFTER ORDER IS RECEIVED

Under high speed production, the new Enco "compound replacement" turret offers you maximum tool rigidity on heavy cuts. By replacing the compound, this new model eliminates possible sources of chatter and inaccuracy—if gibs or screws are worn—and insures you a cleaner, more accurate finished job every time because tools remain on center.

The turret block has 12 indexing positions spaced 30° apart, permitting each of 4 tools to perform more than one operation. A facing tool, for example, may be used for turning by indexing the same tool to next position. This flexibility means standard ground or angular tools may be used without special re-grinding.

Turrets are shipped complete and ready for use without further machining. When ordering please furnish all required dimensions shown on the chart.

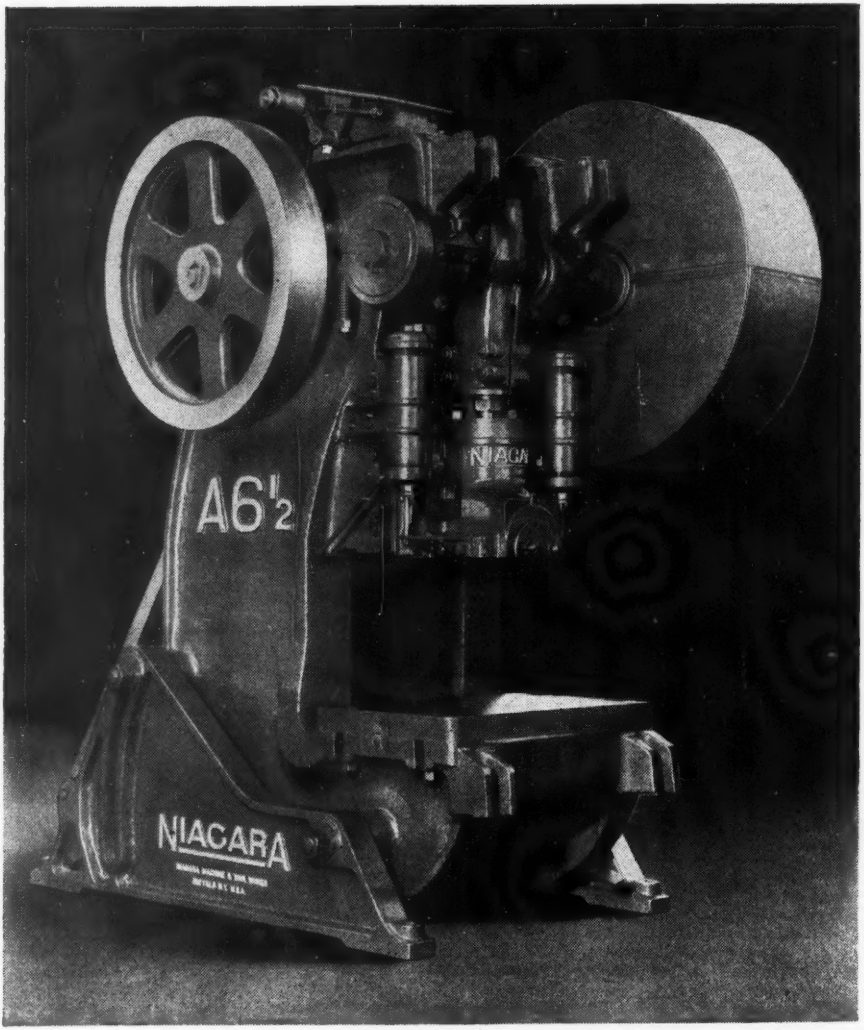


LATHE SPECIFICATIONS.									
MAKE OF LATHE AND SIZE	S	T	U	V	W	X	Y	Z	TOOL HOLDING OR TOOL END VIEW

NOTE—Give "S" in decimal dim. whether pilot or hole. If hole is in cross slide give only "U" dim. If pilot is in cross slide give only "T" dim.

ENCO MANUFACTURING CO.

Department 49, CHICAGO 39, ILL.



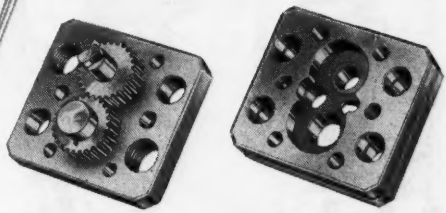
America's War Production Program is being speeded up by the use of Niagara Open Back Inclinable Presses. The No. 6½ shown above is one of the complete, well graduated Niagara line ranging from 7 to 190 ton capacities. Their many features contribute to LONG DIE LIFE AND MORE WORKING STROKES PER HOUR. Complete specifications are given in Bulletin 58, available upon request. Niagara Machine & Tool Works, Buffalo 11, N. Y. District Offices: Cleveland, Detroit, New York.

BUY U. S. WAR BONDS AND STAMPS



BEHIND **ALL** THE USES OF

NYLON THREAD...



Produced by W. H. Nichols & Sons, Waltham, Mass. for Zenith Products Co., Newton, Mass.

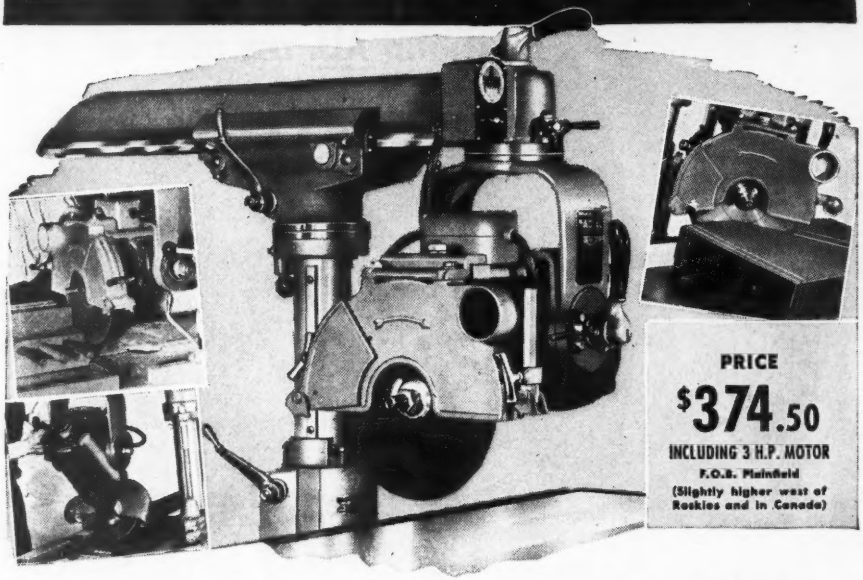
These High-Performance Pumps of OHIO DIE STEEL

are used wherever Nylon thread is produced. The molten Nylon emulsion is forced through the pump and as a result of this close contact, the operating temperature of this pump reaches 600° Fahr. and above. The hardness of 58-60 Rockwell C is maintained for an indefinite period at this temperature. Pumps are manufactured on an interchangeable basis to standards requiring lapping to plus or minus .000025", gears finished to .00005" and surface scratches held to less than two millionths of an inch. OHIO Die was selected for this exacting application because of its outstanding toughness, constant response to heat treatment and unusual dimensional stability.

Vanadium-Alloys STEEL CO. LATROBE, PA.

COLONIAL STEEL DIVISION ★ ANCHOR DRAWN STEEL CO.

THIS *Universal Head* SIMPLIFIES COMPLICATED CUTTING OPERATIONS



PRICE
$374.50
INCLUDING 3 H.P. MOTOR
F.O.B. Plainfield
(Slightly higher west of Rockies and in Canada)

Walker-Turner METAL-CUTTING RADIAL MACHINE

The head on a Walker-Turner Metal-Cutting Radial Machine can be quickly set to cut at any angle. Cuts wide metal shapes. Will dado, trench, miter, *even operate with motor in vertical position.* Patented Walker-Turner Geared Motor is shock-proof, gets shaft closer to work, makes deep cuts with smaller blades than in conventional motors. Blade feeds through work with shorter cutting arc and less frictional heat. Operator gets clear view of work, no interference from overhanging arm. Write today for complete information.

WALKER-TURNER COMPANY, INC., Plainfield, New Jersey

walker-turner COMPANY, INC. PLAINFIELD, N.J. U.S.A.

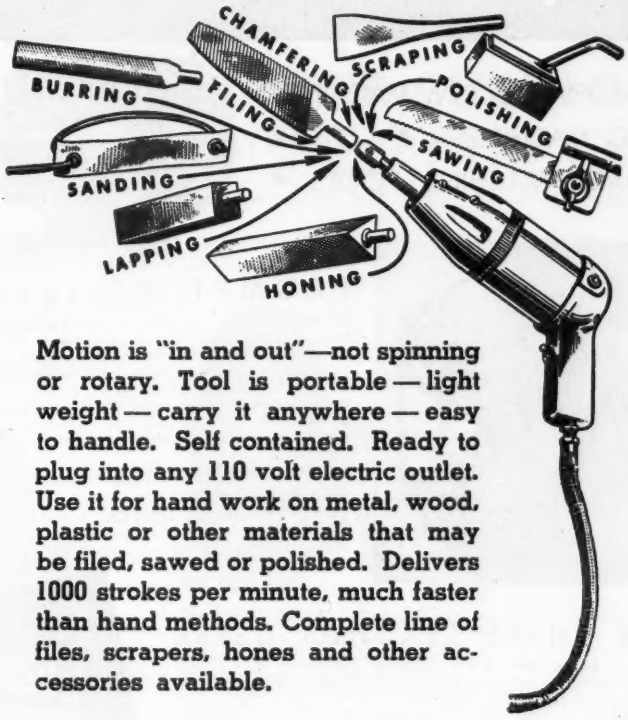
MACHINE TOOLS

DRILL PRESSES — HAND AND POWER FEED • RADIAL DRILLS
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

For SPEED and PERFORMANCE!

Reciprocating Action (In and Out)

PORTABLE *Electric* H & H TOOL



Motion is "in and out"—not spinning or rotary. Tool is portable — light weight — carry it anywhere — easy to handle. Self contained. Ready to plug into any 110 volt electric outlet. Use it for hand work on metal, wood, plastic or other materials that may be filed, sawed or polished. Delivers 1000 strokes per minute, much faster than hand methods. Complete line of files, scrapers, hones and other accessories available.

Delivery from Stock

Acme Tool Company

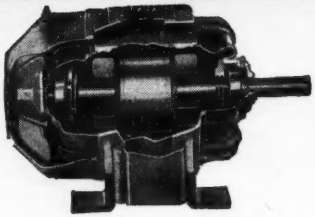
196 CHURCH ST. • NEW YORK 13, N. Y.

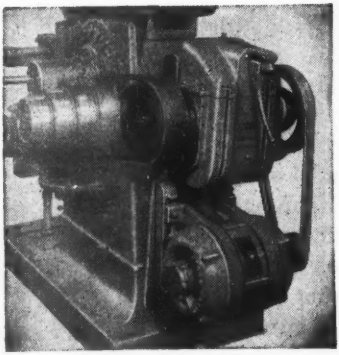
Mfd. by H & H RESEARCH CO.

Speed PRODUCTION UP TO 25% WITH

TORQ *MOTORS AND DRIVES*

FOR LATHES • SCREW MACHINES
MILLING MACHINES • OTHER
STANDARD MACHINE TOOLS •





PROMPT DELIVERIES

In most cases we can deliver within three or four weeks. And that means **early** speed-up of your production, thanks to modernization of your present equipment. With Torq drives and motors you may speed production up to 25%, and make the change-over so easily you lose no valuable production time in waiting. You will be prepared for post-war with completely modernized equipment.

ELECTRIC MOTORS: Totally enclosed, fan-cooled, anti-friction bearings.

TORQ-QUA-MATIC DRIVES: 4 selective speeds, 1 to 15 H.P., alloy steel gears, anti-friction bearings. Proven design . . . improves production up to 25%.

NOTE THESE LEADING USERS

Listed here are a few of the leading American War Plants which successfully use Torq Motors and Drives: White Motor, Cleveland Cap Screw, Cutler-Hammer, Republic Stamping, Valley Mould & Iron, H. B. Sacker Mfg. Co., Thompson Products.



Write for descriptive catalog.

THE TORQ ELECTRIC MANUFACTURING CO.
6605 CARNEGIE AVE. CLEVELAND, OHIO

3

WHEELS • BLOCKS • STICKS • RODS

A COMPLETE LINE IN EACH TEXTURE
for
Close-Tolerance, Precision
Manual and Machine
BURRING • FINISHING • POLISHING

RESILIENT, RUBBER-CUSHIONED ABRASIVE TEXTURES

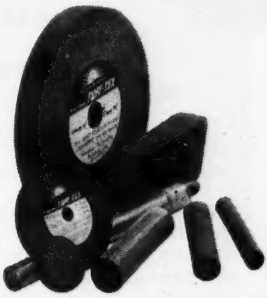
- **ELIMINATES GRIND-TO-BUFF PRODUCTION STEPS**
- **ASSURES OUTSTANDING PRODUCT-QUALITY**
- **FINISHES ALL METALS**



Brightboy STANDARD
Brightboy STANDARD texture is a favorite for burring, finishing and polishing on the widest variety of metals and metal parts.



Brightboy FINE-TEX
Smoother, finer texture for work on softer metals, producing special finishes and for applications where the coarser wheel might not be suitable.

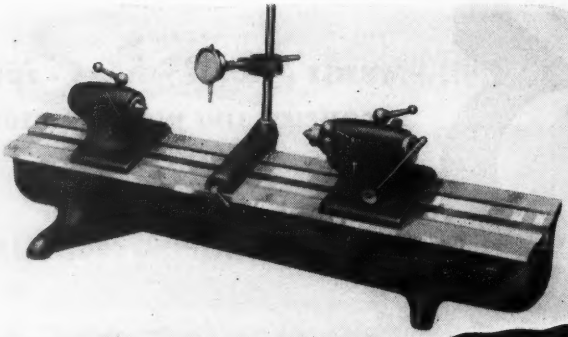


Brightboy TUFF-TEX
Tougher texture, for finishing hard metals. The tougher binder accents the abrasive action, yet retains the soft rubber cushion, finishing and polishing in one operation.

Get Catalogs and prices from your distributor; production short-cut suggestions from Brightboy service representatives.

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.
Newark 7, N. J.

WELDON ROBERTS
Brightboy





Check the Concentricity QUICKLY, ACCURATELY with AMERICAN BENCH CENTERS

When you are working on shafts, bearings and other precision parts requiring perfect concentricity, American Bench Centers give you quick, accurate control.

New, modern, streamlined design. Bed supported on three feet; always rigid on bench. Face of bed inclined 30° toward operator to provide most convenient working position, allow more room for operator's hands, and prevent its misuse as "catch-all" for tools.

Both head and foot stocks adjustable and locked by clamping levers. Centers are hardened steel; the right one spring-operated with retracting lever for quick removal of work without changing adjustment.

Regularly furnished with adjustable bracket and dial indicator reading .001"; indicators reading to "tenths" may be had at slight extra charge. Multiple diameters checked simultaneously by use of extra brackets and indicators.

Three sizes: 4" dia. x 10"; 6" dia. x 24"; 8" dia. x 36". Riser blocks available to swing 24" diameters.

Send for Bulletin 43-M for details on Amplifying Gages, Thread Checkers, Hole Checkers, Radius Dressers and Lapping Plates.

THE AMERICAN GAUGE CO.
125 Bayard St. DAYTON 1, OHIO

Cut Cutting Costs with BORCOLOY®

® M. REG. U. S. PAT. OFF.



4 *surfaces machined* 1 *Borcoloy Tool Operation*

This NE 8630 Chrome Molybdenum steel "fork", 1.250" in diameter, was formerly machined in four separate operations with complete changes in set-up for turning, facing and cutting. Yet with a BORCOLOY FORM TOOL (ground from a 1" square tipped tool) the daily production has increased 100%. The time now required for the entire job is merely the time for the longest cut.

On regular production runs, operating at 90 S.F.M., .004" feed per revolution and .155" greatest depth of cut, a minimum of 1000 pieces are being machined between tool grinds, thus proving the advantages of BORCOLOY for Form Tooling applications.

BORCOLOY is a centrifugally cast ferrous alloy that incorporates the superior Hardness of heat-treated steel (Rockwell up to C-71) with the "Red Hardness" of Cobalt and the "Wear and Abrasive Resistance" of Boron. A range of 3 grades will thoroughly cover your cutting requirements:

Grade 5 where wear resistance is the principal factor.

Grade 6 for maximum hardness.

Grade 7 to give you high "Red Hardness" for your fast cutting production jobs.

If you are faced with difficult cutting problems, try BORCOLOY TOOLS and prove to yourself how you can machine more material with greater accuracy in less time. *Cut Cutting Costs with BORCOLOY!*

GENERAL AIRCRAFT EQUIPMENT, INC.

Tool Division; South Norwalk, Conn.

Branch Offices: Newark Detroit Los Angeles

Canadian Sales: General Aircraft Equipment of Canada Ltd., Montreal, P Q



KALAMAZOO *Metal Cutting* Band Saw

The most practical, convenient and efficient equipment for HIGH SPEED PRODUCTION in cutting off metal to lengths. Handles solids, tubes and all metals.

Compact coolant attachment eliminates messy floor pans, does not interfere with operation of machine and enclosed saw frame prevents all splash or drip on back travel. High grade pumping unit assures uninterrupted service and has ample capacity for any job.

Supplied without coolant for intermittent cutting. Portable-plugs in anywhere. Two sizes—8" x 16" and 8" x 24".

First choice of efficiency engineers. Ask your dealer or write for bulletin.

MACHINE TOOL DIVISION

KALAMAZOO TANK & SILO CO., Kalamazoo 16, Mich.

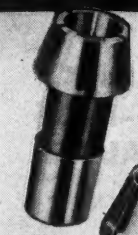
IN CANADA: BRIDGE MACHINERY CO., MONTREAL

WHEN COLLET WORK IS INDICATED - SPECIFY

Precision Collets

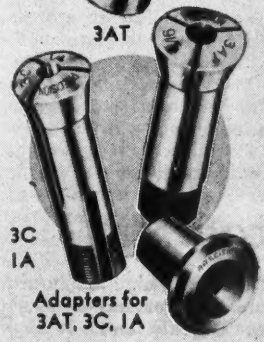
For 10" ATLAS & LOGAN, SOUTH BEND, SHELDON, CRAFTSMAN, POWR-KRAFT, CLAUSING and other important lathes.

IMMEDIATE DELIVERY FROM STOCK



BREN

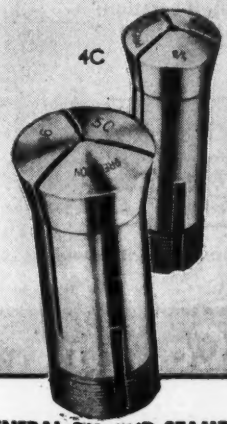
480
(AC-50)



3AT

3C
1A

Adapters for
3AT, 3C, 1A

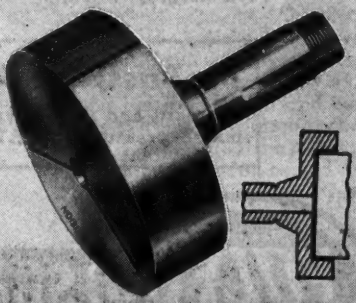


4C

The *Precision* name on a collet is your unconditional guarantee of accuracy in machining, hardening and grinding. Make sure then to specify *Precision* when ordering from your dealer. Literature on request.

- MODEL 3AT: For 10" Atlas, Logan, 12" Craftsman, No. 700 Powr-Kraft.
- MODEL 3C: For 8" & 9" South Bend, Clausing, Hardinge No. 3, 10" LeBlond, etc.
- MODEL 1A: For 8" & 9" South Bend.
- MODEL 5C: For 9", 10", 16", 18" South Bend, 1" capacity Sheldon, Schauer, Sebastian, etc.
- MODEL 4C: For 14½" South Bend, ¾" capacity Sheldon, Hardinge No. 4, Elgin, etc.
- MODEL 480: For Logan Screw Machine, Turret Lathe and attachments; Warner & Swasey No. 1, etc.
- BREN Collet: For Handwheel & Lever-Type Speedichuk.

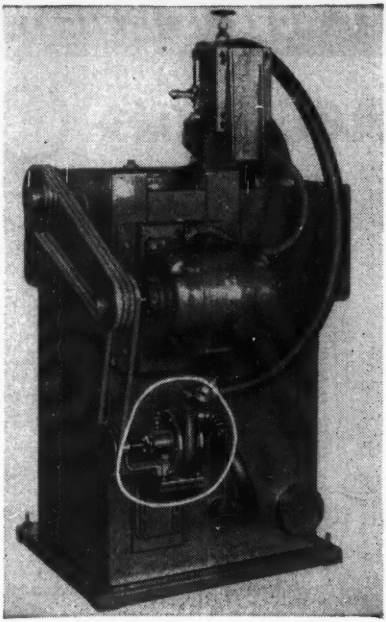
KLUTCH - KOLLET (Step Chuck) for chucking work to 2¾" diameter with collet accuracy. Head unhardened for easy boring. Fits 3AT, 3C, 1A adapters only. List unbored $7.50 each.



• 5C KLUTCH-KOLLET NOW READY. List Unbored $10.50.

GENERAL DIE AND STAMPING COMPANY • 262 MOTT ST., NEW YORK 12, N. Y.

FULFLO COOLANT PUMPS



FULFLO BY-PASS VALVES

FOR A STEADY FLOW OF COOLANT

That's all FULFLO CENTRIFUGAL COOLANT PUMPS do . . . but it's their sturdy construction, dependable, unswerving performance which makes them so superior. Quickly and easily installed. Numerous models for every coolant purpose . . . special types designed on request. Right or left rotation; direct, belt or motor drive. Special patented seal.
Pipe sizes 3/8" to 1½".

By-Pass, Oil-Relief Valves

Standard and flange types. Five springs for pre-determined pressures. CHATTERLESS. Pipe sizes ¼" to 2".

THE

Write for Fulflo Mechanical Data Book

TRADE MARK
FULFLO
REG. U.S. PAT. OFF.
Specialties Co., Inc.
BLANCHESTER, OHIO

A 'WAR VETERAN' *with a distinguished Service Record*



Long before Pearl Harbor, Dremel MOTO-TOOL won its spurs by the way it tackled tough jobs in tool rooms and machine shops, and on production lines. But since American industry swung its full strength into war production and our armed forces established far flung assembly and repair bases the already healthy demand for these mighty little midgets has quadrupled.

Operators as well as owners of Moto-Tools are constantly discovering new jobs . . . new ways to save time and cut costs . . . with these pocket size machine shops. Girls quickly become proficient in the use of them because a Moto-Tool weighs but 13 ounces, is shaped to fit the hand, has a balanced armature to prevent vibration. Thousands of Moto-Tools are helping to establish production records in plants such as General Electric, Westinghouse, Remington Arms, Ford, Nash-Kelvinator, Consolidated Aircraft, Northrup, Douglas, and many others. Besides, Moto-Tool has won the respect of every branch of the U. S. land, sea and air forces.

A FEW OF THE MANY JOBS THAT CAN BE DONE BETTER AND FASTER *with* MOTO-TOOL

☐ Sharpening	☐ Burring	☐ Cleaning
☐ Finishing	☐ Grinding	☐ Routing
☐ Touching-Up	☐ Polishing	☐ Cutting
☐ Sanding	☐ Burnishing	☐ Rasping
☐ Drilling	☐ Inlaying	☐ Carving
☐ Mortising	☐ Sawing	☐ Brushing
☐ Engraving	☐ Scoring	☐ Dressing



Model 2 Moto-Tool, complete with 23 accessories, in felt-lined hard wood case . . . **$23.50.** Model 2 Moto-Tool only, with one emery wheel point . . . **$16.50.**

A Model 2 Moto-Tool develops 27,000 rpm . . . the proper speed for clean, smooth, accurate work, and long life from points and cutters. It is sturdily built throughout and has a shock-proof bakelite housing and oil-less (oil sealed) bearings. Uses 110-120 volt AC or DC current. Ask your Mill Supply salesman about Dremel Moto-Tools and accessories. If his firm does not carry them write factory or nearest Dremel representative. Prompt shipment on orders with proper priority.

DREMEL MANUFACTURING CO.
Dept. T225-G **Racine, Wis.**

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Alhambra, Calif.

Mill Factor Products
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New York, N. Y.

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Boston 10, Mass.

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Seattle, Wash.

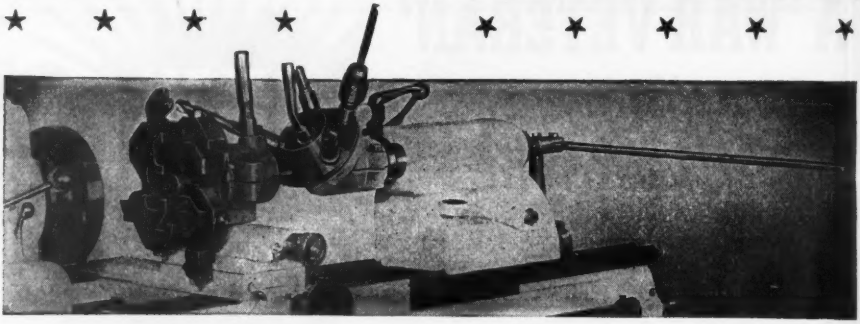
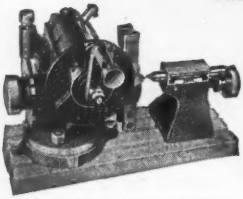


Photo above shows Jefferson Turrets on 16" lathe

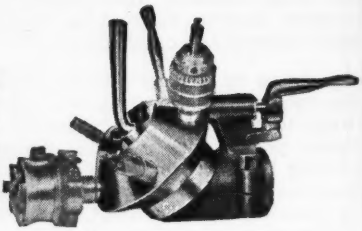


7½" Swivel Base Dividing Head—

In Stock — Immediate Delivery — No Priority Required

Convert

YOUR ENGINE LATHE INTO A TURRET LATHE IN 15 SECONDS



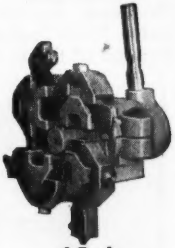
Yes, it's as easy as that! You simply attach the Jefferson Tail-Stock Turret, the Jefferson Tool-Post Turret, and the Jefferson Adjustable Pull Feed to your lathes as shown in illustration.

The productive capacity of these machines will be more than doubled in many instances because there will be available at all times NINE DIFFERENT TOOLS.

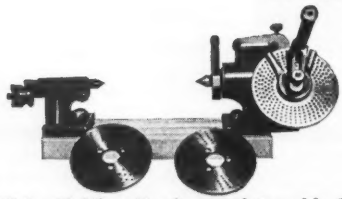
With these three JEFFERSON time-saving devices attached to a lathe, any kind of work may be done, such as forming, roughing, boring, finishing, knurling, drilling, tapping, etc., without stopping the lathe, or changing tools. The JEFFERSON TURRETS are made very substantial, rigid, accurate and in several sizes to fit small bench lathes up to 24" swing.

5-Tool Tail-Stock Turret

PAT. PENDING



4-Tool Tool-Post Turret



Plain Dividing Head—complete with 3 Dividing Plates, 1 24-notch rapid Indexing Plate and Tailstock. Delivery 2 weeks. 7½" Swivel Base Dividing Head and 6" Tilting Dividing Heads. Immediate Delivery.

Some territories still open for dealers and salesmen.

Jefferson Turrets are real production tools—substantial, rigid, accurate and adaptable to any size or make of engine lathes. They must not be confused with the small makeshift gadgets now on the market.

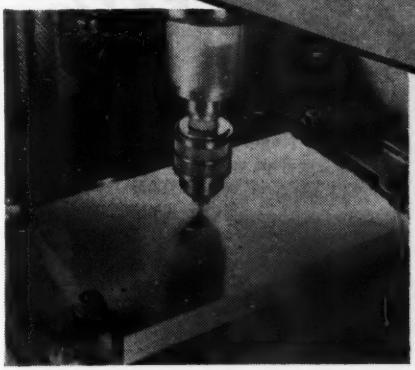
TURRET DELIVERIES IN 6 DAYS

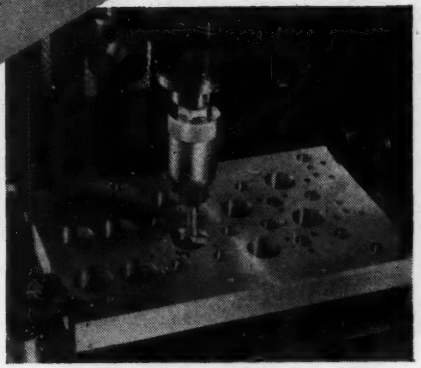
JEFFERSON MACHINE TOOL CO.

750 W. Fourth St., Cincinnati, Ohio

Tool-Post Turrets, Tail-Stock Turrets, Adjustable Pull Feeds, Belt Sanders, Gyratory Foundry Riddles, Overhead Swing Frame Grinders, Milling Machines, Dividing Heads and Vises.

HOW TO OBTAIN *increased speed* AND *closer tolerances* IN JIG BORING





NO S-T-O-P and S-T-A-R-T TO CHANGE TOOLS AT EACH HOLE

In the Moore Jig Borer you can *consecutively* spot, drill, bore and ream *all* holes in the work-piece with minimum tool changes. In other words, you don't have to change tools at individual holes for each operation, because there are no size blocks or end measures to labor over.

Accurate lead screws *built into* the Moore Jig Borer enable you to make table settings faster than you can change tools. A glance at your blueprint—a few turns of the micrometer dials and the work is set to precise location. Moore lead screws, accurate to .0002" over 14" of travel and .00005" in any given inch see to that. Another advantage—you make each setting three times, enabling you to quickly notice and correct any errors you may have made.

The Moore Jig Borer is ideally suited for jigs, fixtures, dies, special machine parts and jig-less, small-lot production. It is highly sensitive for holes 1/32" diameter, yet rugged for heavy cuts up to 4½".

RAPID TABLE SETTINGS PROMOTE GREATER ACCURACY IN FINISH BORING

Rapid table settings on the Moore Jig Borer encourage operators to follow the best toolroom practice—roughing *all* holes before finish-boring *any* of them.

Moore lead screws are so fast to set—faster than tool changes—that it *pays* to pre-rough all holes. Temperature changes or stresses caused by roughing cuts *cannot* interfere with finish-boring.

After roughing, the set-up can be easily checked and re-set before taking any finish cuts.

All finish-boring is completed without stressing or heating of the work-piece. These favorable conditions, maintained throughout the entire finish-boring operation, on the Moore Jig Borer, are further assurance of ultimate accuracy in the completed work.



Write today for descriptive literature

MOORE MAKES TOOLS

MOORE JIG BORER

MOORE SPECIAL TOOL CO., INC., 730 UNION AVE., BRIDGEPORT 7, CONN.



Why AIR tools are Better...

1. Air tools are much smaller than comparable tools otherwise powered. This means:
   - a. Less weight
   - b. Easier handling
   - c. Less operator fatigue
   - d. More work per man per shift
2. Air tools cannot be harmed by overloading. This means:
   - a. No parts will burn out
   - b. Longer life; less maintenance
3. Air tools are safe. This means:
   - a. No danger of fire, explosion or injury to worker
   - b. They may be used around hazardous materials
4. Air tools start and stop instantaneously This means:
   - a. Maximum power reached more quickly
5. Air tools are the only successful tools for reciprocating operations. This means
   - a. For riveting, ramming, etc., air tools are most effcient.

• And CLECO AIR TOOLS are *better* because our manufacturing methods — machining, heat-treating, inspection — are unexcelled. We have perfected our production processes through more than 50 years of making the best pneumatic tools. Write for 150-page, illustrated Catalog 44.

THE CLEVELAND PNEUMATIC TOOL CO.

BRANCH OFFICES IN PRINCIPAL CITIES

3761 EAST 77th STREET • CLEVELAND 5, OHIO



FACTS PR[illegible]

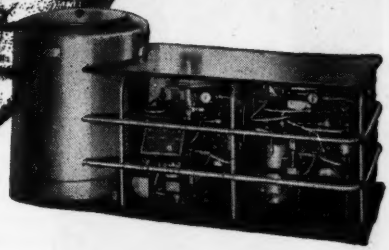
that you need [illegible] your plant

Records Su[illegible]

Deepfree[illegible]

Cold Treati[illegible]

to Low [illegible]



OPERATION	PART	PERFORMANCE PRIOR TO COLD TREATMENT	PERFORMANCE FOLLOWING COLD TREATMENT
HARDENING	High Speed Drill	48 holes per grind	250 holes per grind
	Tap	40 pieces per grind	500 pieces per grind
	Milling Cutter	1 hours per grind	24 hours per grind
STABILIZATION	Pump Plunger	Operation unsatisfactory due to metal growth	Perfect operation indefinitely due to complete stabilization
	Gauge Blocks	Blocks expanded and warped	Blocks held original size and shape
	Lapping Flats	Resurfacing required every 2 to 3 hours	Resurfacing required every 2 to 3 days
SHRINK FIT	Airplane Landing Struts	20 minutes required for assembly	10 minutes required for assembly
	Tapered Roller Bearing Race	hour to insert in casting	minute to insert in casting

These performance records are typical of economies obtained in many of the nation's leading industrial plants by the use of Cold Treating in various production processes—economies which can be duplicated under similar conditions in your plant.

Cold Treating is used to accomplish a variety of purposes—all with equal efficiency and economy. Foremost among these are hardening metals and metal parts; stabilizing precision parts, gauge blocks, lapping flats, etc.; shrinking metal parts for rapid assembly; and testing of instruments and equipment for high altitude, low temperature operation. In addition, Cold Treating is performing a multitude of specialized operations too numerous to mention.

You, Too, Can Profit by Using Cold Treating

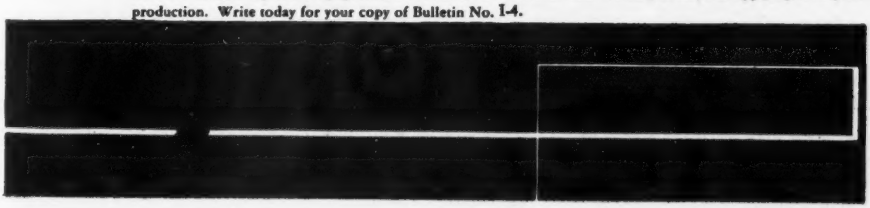
Whatever your production, a survey of the outstanding results obtained by applying sub-zero temperatures to industrial operations—a few of which are shown in the panel at left—is convincing proof of the economical value and utility of this newest "tool" for industry. Think what such results can mean to your operations in terms of production economies and improved quality of your product.

Let Deepfreeze Engineering Service Assist in Adapting Cold Treating to Your Production

If you are unfamiliar with industrial Cold Treating or are using it on a limited scale and are interested in increasing its range of utility, contact Deepfreeze Engineering Service. Our experienced refrigerating engineers will make a complete study of your product and production setup and enumerate the possibilities and advantages of applying it on the broadest possible scale. This service will not obligate you in any way.

FREE . . . Complete Cold Treating Information

This new 40-page booklet contains all of the facts necessary for a complete understanding of industrial Cold Treating. It explains in detail what occurs within a metal structure when cold treated; illustrates its many uses and resultant savings in time and money; lists up-to-date Cold Treating procedures, gives the names of manufacturers using Deepfreeze equipment; and numerous additional data which you need in applying it to your production. Write today for your copy of Bulletin No. I-4.





ANNOUNCING

The NEW TAFT-PEIRCE *Emmerton** BALL-BEARING PILOT PLUG GAGES

This new design of plug gage is distinguished by a pilot ring of hardened steel balls on the front end of the gage, which are free to rotate in any direction, so that they automatically guide gage and work into positive alignment, regardless of the angle of approach.

Taft-Peirce Ball-Bearing Pilot Gages enter the work on their own weight, *and can't jam*, even though gage diameter is exactly that of the hole. There is no danger of end wear, shearing, or burring. Speed and accuracy of inspection is assured, and even unskilled workers can be turned into competent inspectors. For prices and available sizes of Taft-Peirce Emmerton Plug Gages, write to

THE
TAFT-PEIRCE MFG. CO.
Woonsocket, Rhode Island

Use Taft-Peirce Gages for Every Gaging Need

SPECIAL ADVANTAGES

of Taft-Peirce Emmerton Ball-Bearing Pilot Plug Gages:

- Faster, easier gaging
- Definite gaging to maximum tolerance
- Fewer rejects; gage will pass through minimum hole
- No jamming; no time is lost in freeing work
- Manufactured to Taft-Peirce standards of quality, and accuracy of finish
- Longer gage life, lower gage costs

* *British Patent No. 548129 and Colonial and Foreign. American Patent Applied For. App. No. 436790.*



SAVE WITH

INGERSOLL *Inserted Blade* ARBOR CUTTERS

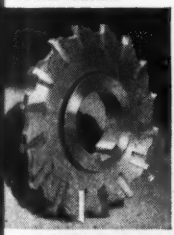
HALF SIDE MILLS • FULL SIDE MILLS • STAGGERED TOOTH SLOTTING • CHANNELING • INTERLOCKING



INTERLOCKING



CHANNELING



3-LOCK NARROW SLOTTING



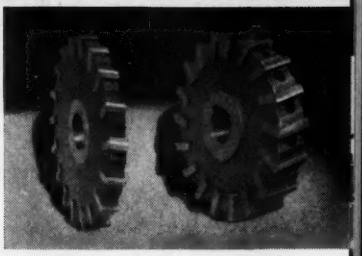
FULL SIDE MILL



Ingersoll *inserted blade* arbor cutters are replacing solid high speed steel and solid brazed tip designs due to economy of replacement blades. It is not necessary to purchase complete new cutters, as only the *inserted blades* are perishable. The cost of a new set of blades is much less than the cost of a new solid type cutter.

There is an Ingersoll *inserted blade* cutter for all straddle milling, keyway cutting, channeling, or slotting operations requiring cutters from 4" diameter and ⅜" wide up to any size that may be required. Several different styles and types are illustrated here and each has its particular field of application. Cutters may be furnished with high speed steel, cast alloy, or carbide tipped blades, and with cutting angles suitable for cast iron, steel, aluminum, or any other non-ferrous alloy.

Ingersoll designs and manufacturers inserted blade milling and boring tools of all types. Write for Engineering Specification Sheets describing the standard face mills, arbor cutters, end mills, and helical cutters.

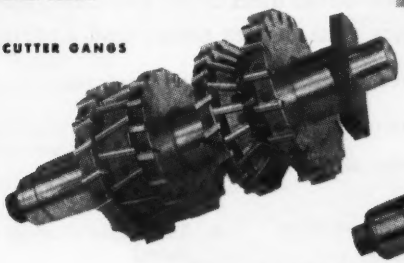


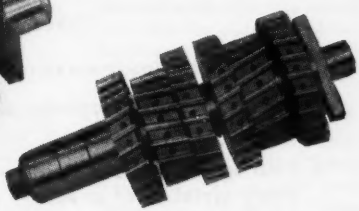
HALF SIDE MILLS



STAGGERED TOOTH SLOTTING

CUTTER GANGS





Use This
WALL CHART

Wall chart suitable for mounting in tool room illustrating proper grinds for milling cutters.



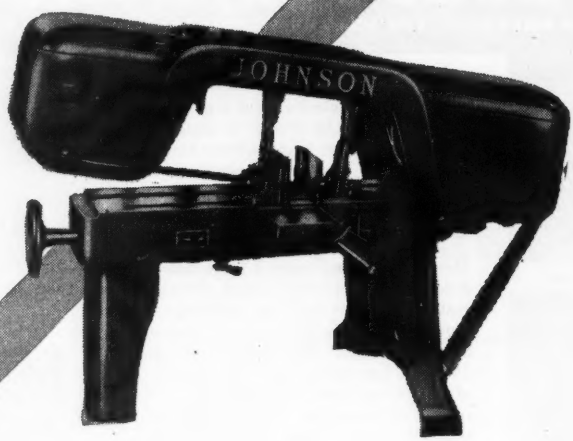
Write for
INGERSOLL CUTTER GRINDER BULLETIN

describing operation of machine and fundamental principles of good cutter grinding.



THE INGERSOLL MILLING MACHINE CO., ROCKFORD, ILL., U.S.A.

This *thinner* Blade
cuts down metal waste



Only .032" thin, the blade in the Johnson Metal Cut-off Bandsaw cuts straight and true —and economically. Loss of expensive metal is held down to less than 3/64" per cut! That's performance that makes sense and savings.

Other Important Johnson Features

1. 3-point base insures even cuts
2. Box type frame protects movable parts
3. Four speeds provide right speed for every metal, hard or soft
4. Hydraulic control insures even pressure throughout cut
5. Coolant attachment minimizes friction, prolongs blade life
6. Automatic shut-off after cut is completed

WRITE TODAY FOR FULL DETAILS

JOHNSON MANUFACTURING CORP.

5000 CHRYSLER BLDG. • NEW YORK 17, N Y.

Your Product May Change after V-Day

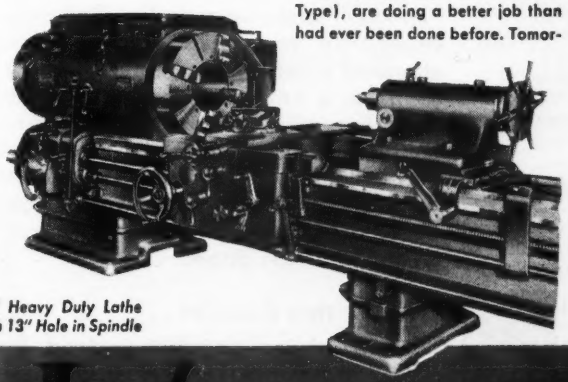


BUT-

HYDRATROL LATHES
(LARGE HOLLOW SPINDLE TYPE)

Will Continue to Increase Production-Lower Costs!

Today, in hundreds of war plants, under all sorts of conditions, HYDRATROL LATHES (Large Hollow Spindle Type), are doing a better job than had ever been done before. Tomorrow, on the peacetime production line, HYDRATROL LATHES will continue to increase production—improve work, cut costs. Let us show you how HYDRATROL LATHES can solve your present machining problems and at the same time prepare your plant for efficient, profitable peacetime production.



30" Heavy Duty Lathe with 13" Hole in Spindle

FIVE SIZES—18" TO 36"

Small . . . . 18" up to 7 1/4" Hole
Medium . . . . 24" up to 12" Hole
Large . . . . . 27" up to 13" Hole
Large . . . . . 30" up to 14" Hole
Large . . . 36" up to 16 1/2" Hole
(Standard type lathes, 16" to 36")

Lehmann MACHINE CO.

CHOUTEAU AT GRAND ★ ST. LOUIS 3, MISSOURI

Grind it on a BESLY...

FOR FAST, ACCURATE, LOW-COST PRODUCTION



Enlarged view clearly shows needle cups positioned under clamping levers and convenient dial gauge.

An Actual Case...

The model 218-20" Besly Double Spindle Grinder, illustrated above, is used for grinding the steel needle cups for universal joints. Cam-operated spring clamping levers on feed wheel grip cups tight enough to prevent them from spinning on the plugs —*particularly when entering and leaving grinding zone.* In cycle of operations, cups pass dial indicators which gauge distance between the face of locating pins and ground face of the cups. At each pass .011 to .014 is removed—holding pieces to .002 for uniformity. Production: 900 pieces an hour.

When there's anything "special" about a grinding job—let Besly help you. Simple changes in a standard grinder may be sufficient or, perhaps, a new design is necessary. In either case, Besly engineers, who have given such service for more than half a century, can match your needs with the right grinder and the right abrasive—*to do your work exactly as it should be done.*



Ask for this Booklet...

Write for it today—*on your letterhead.* It's free! You will find it helpful for ready reference on grinding wheels and abrasives. Besly Titan Steelbacs speed production.

CHARLES H. BESLY AND COMPANY, 118-124 N. Clinton St., Chicago 6, Ill. • Factory: Beloit, Wis.

OUTPUT UP 20% . . . Rejects, Scrap & Refinishing CUT SHARPLY . . .

LIPE *Pneumatic* BAR FEED

Gives You ALL These Performance Advantages . . .

FAST—saves up to 20 minutes on a 12-foot bar.

EFFICIENT—increases output up to 20%.

AUTOMATIC—feeds instantly to the fixed stop as soon as the collet is opened.

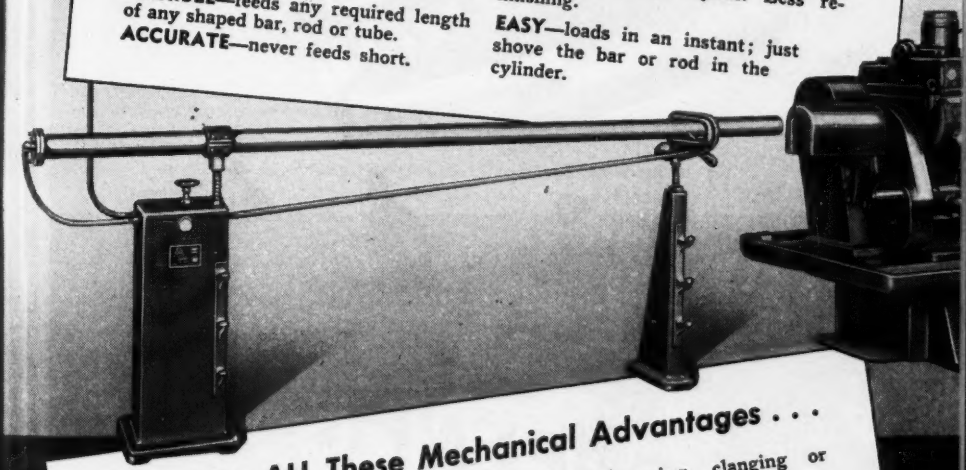
FLEXIBLE—feeds any required length of any shaped bar, rod or tube.

ACCURATE—never feeds short.

THOROUGH—feeds to the least possible remnant. Lowers scrap losses.

ECONOMICAL—handles exact-sized, polished stock without marring or scratching. Fewer rejects. Less refinishing.

EASY—loads in an instant; just shove the bar or rod in the cylinder.



Gives You ALL These Mechanical Advantages . . .

SIMPLE—just a low-pressure air cylinder and a piston with a ball-bearing cup center for holding the rod.

COMPLETE—ready to use when you get it, just hook it up to your shop air line.

SAFE—bar is completely enclosed by the cylinder. No whirling or whipping ends to require guards or cause accidents.

FOOL PROOF—feed power cannot be applied unless the cylinder is locked in proper working position.

QUIET—no humming, clanging or banging.

TROUBLE-FREE—eliminates all troublesome feed fingers, collars, ratchets and wobble plates.

LOW COST—pays for itself quickly in the time, materials, re-finishing and accidents it saves.

Available for all hand screw machines up to 2½" diameter capacity, and for automatic screw machines Nos. 00, 0, 2 and 6. Write today for complete information. A nearby Lipe technical representative will call if you wish.

ARMY E NAVY

LIPE-ROLLWAY CORPORATION

SYRACUSE 1, N. Y.

Grind it on a BESLY...

FOR FAST, ACCURATE, LOW-COST PRODUCTION



Enlarged view clearly shows needle cups positioned under clamping levers and convenient dial gauge.

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OUTPUT UP 20% . . . Rejects, Scrap & Refinishing CUT SHARPLY . . .

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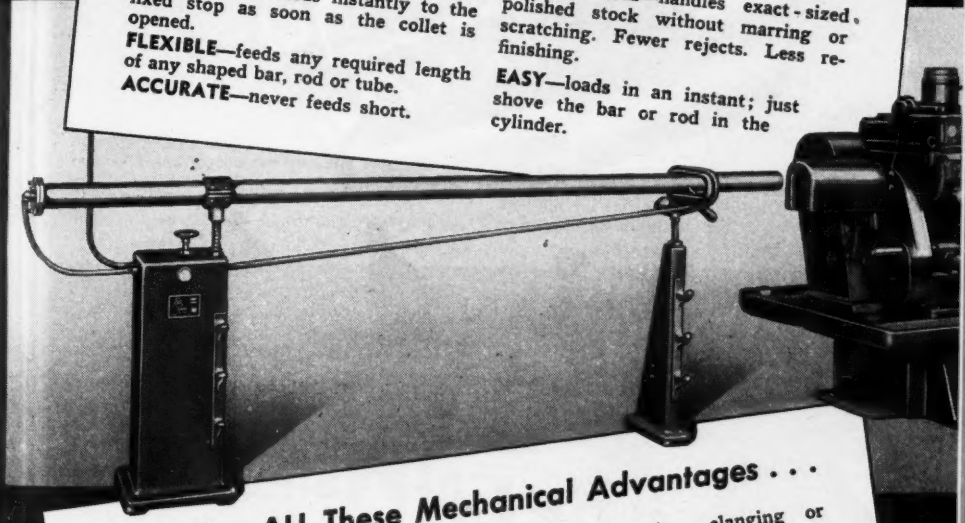
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FOOL PROOF—feed power cannot be applied unless the cylinder is locked in proper working position.

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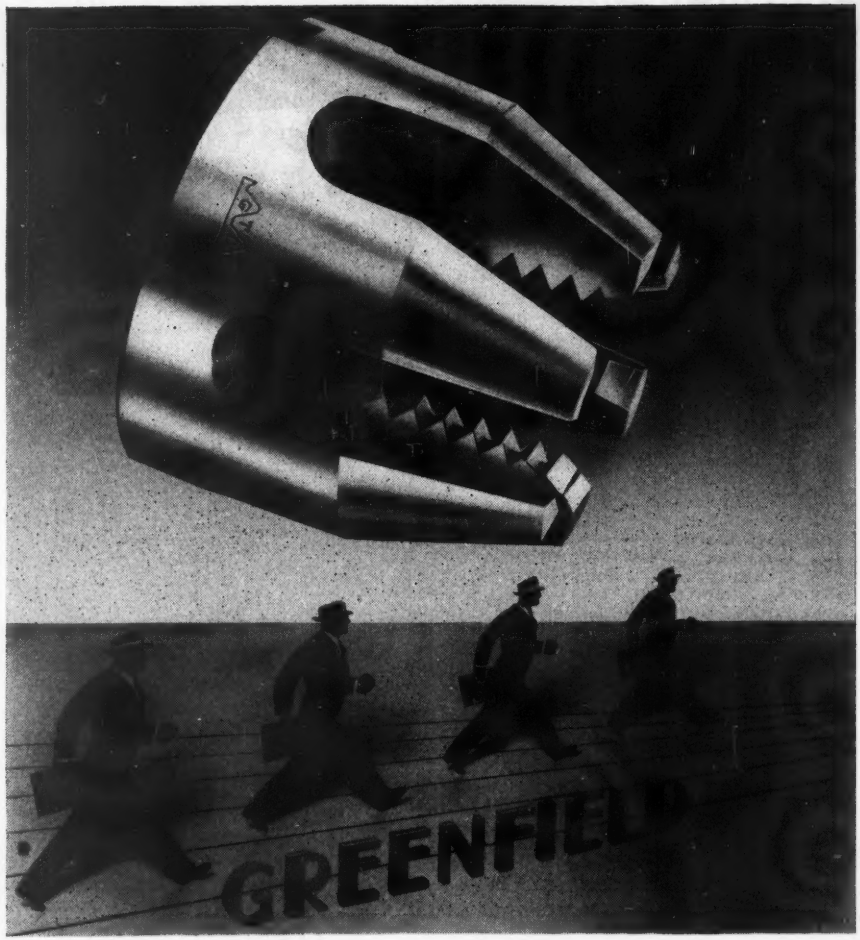
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Available for all hand screw machines up to 2½" diameter capacity, and for automatic screw machines Nos. 00, 0, 2 and 6. Write today for complete information. A nearby Lipe technical representative will call if you wish.

ARMY E NAVY

LIPE-ROLLWAY CORPORATION

SYRACUSE 1, N. Y.



More and Better THREADS WITH "ACORN" DIES

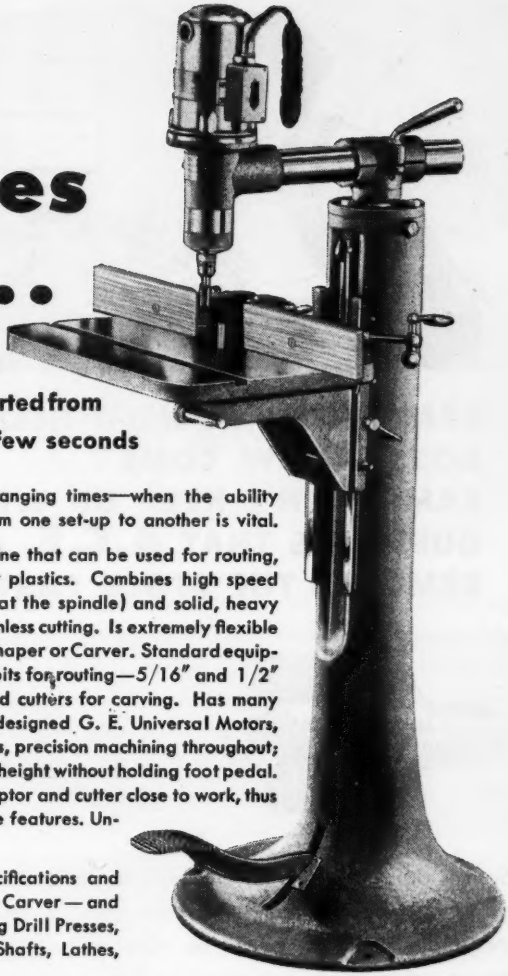
The "Acorn" Die is your key to fast, accurate cutting of external threads. And it's backed by the world's largest field staff of threading engineers. For expert help, get in touch with your local "Greenfield" Distributor. Send for new "Acorn Die" booklet.

GTD GREENFIELD GEOMETRIC

GREENFIELD TAP and DIE CORPORATION • GREENFIELD • MASSACHUSETTS

Taps • Dies • Gages • Twist Drills • Reamers • Screw Plates • Pipe Threading Sets

three machines in one...



This low-cost DURO Router-Shaper-Carver can be converted from one use to another in a few seconds

An ideal machine for these quick-changing times—when the ability to shift rapidly and economically from one set-up to another is vital.

Here is an unusually flexible machine that can be used for routing, shaping and carving wood, metal or plastics. Combines high speed (20,000 R.P.M.) power (1200 watts at the spindle) and solid, heavy construction that gives smooth, vibrationless cutting. Is extremely flexible—can be transformed quickly into a Shaper or Carver. Standard equipment handles 1/4", 5/16" and 3/8" bits for routing—5/16" and 1/2" bore shaper cutters—and all standard cutters for carving. Has many special features including: Specially designed G. E. Universal Motors, New Departure Precision ball bearings, precision machining throughout; Table can be instantly adjusted to any height without holding foot pedal. Chuck is part of spindle and holds adaptor and cutter close to work, thus preventing whip. Many other exclusive features. Unusually low priced.

Send for Catalog—giving full specifications and prices on the DURO Shaper-Router-Carver—and other DURO quality Machines including Drill Presses, Circular Saws, Band Saws, Flexible Shafts, Lathes, Sanders and Electric Drills.

Available on Priorities Only

DURO TOOLS

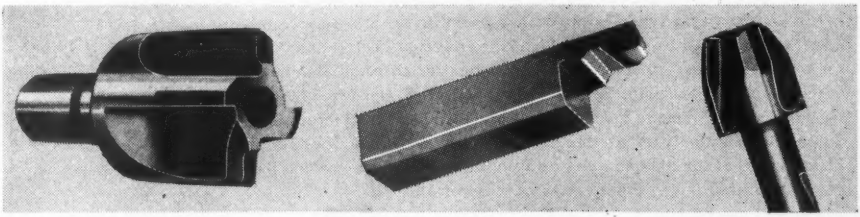
MACHINE TOOL DIVISION

DURO METAL PRODUCTS CO., 2664 N. KILDARE AVE., CHICAGO 39, ILL.

ALSO MAKERS OF DURO HAND TOOLS



SAM:—BOSS—I NEED HELP!
BOSS:—HOW COME?
SAM:—CAN'T KEEP UP WITH THE CHIPS—GUESS IT'S THAT A.C.E. CARBIDE CUTTER REMOVES THE STOCK FASTER THAN I CAN.



Sam is right—the A.C.E. carbide cutter turns out the work so fast that the chips do pile up. Carbide cutters certainly speed up the cutting. Better look into this—you may be able to speed up your production materially with A.C.E. carbide tipped cutters made specially to suit your requirements.

AMERICAN CUTTER
AND ENGINEERING CORPORATION
31743 MOUND ROAD • WARREN, MICH.

A.C.E. SPECIAL CUTTING TOOLS
HI-SPEED OR CARBIDE-TIPPED



Indexing Fixtures

FOR HIGHEST PRODUCTION

SOON, cost per piece will be of primary importance in the machining of all metal parts. Surface broaching is now being used in many plants to produce work similar to these illustrations, with higher production per machine and lower tool maintenance cost than was possible with former machining methods. We will be glad to work with you on the possibility of applying surface broaching to your work. Just send blueprints of your parts with information on number of pieces per hour required.

THE FOOTE-BURT COMPANY
CLEVELAND 8, OHIO
Detroit Office: General Motors Building

MOVE UP THE SCHEDULE ☆ WIN THE WAR QUICKER

Footburt Patented Tooth Form

FOOTBURT *Surface Broaching*

These Small Chicago Wheels





SEND FOR TEST WHEEL

Learn first-hand about Chicago's superiority. Tell us what you have to finish, size wheel you'd like and we'll mail one promptly.



Half a century of specialization has established our reputation as the Small Wheel People of the Industry.

CHICAGO GRINDING WHEELS AND MOUNTED WHEELS

MAKE INDUSTRY HUM!

Millions of whirling abrasive wheels, trained in war's tough school of precision finishing, each doing a prime job in laboratory, tool room, aboard ship, on production line. And—they're all set and eager to tackle civilian goods when peace machinery is singing again.

Whether it's removing burrs, smoothing edges, squaring surfaces so accurately that the finish can be measured in micro inches, or cut-off work—there's a Chicago ready to do a top-ranking job for you.

VITRIFIED GRINDING WHEELS with a 50-year pedigree. Up to 3" in diameter in various abrasives and bonds including the famous FV Bond.

MOUNTED WHEELS. The largest assortment made with a shape and abrasive to take care of every internal and external finishing job.

CUT-OFF WHEELS. All types and sizes. Now offered with the sensational new special-formula RT Bond (rubber or resinoid).

Send coupon for Illustrated Catalog

CHICAGO WHEEL & MFG. CO.

1101 W. Monroe St., Dept. MM, Chicago 7, Ill.

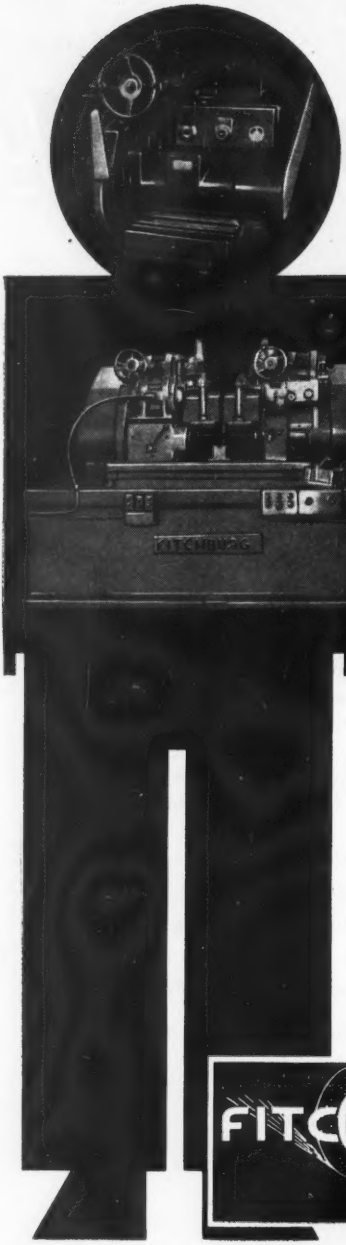
MAIL TODAY

Send Catalog. Interested in ☐ Grinding Wheels ☐ Mounted Wheels ☐ Cut-off Wheels

☐ Send Test Wheel. Size.....

Name .....

Address .....



THIS HEAD FOR MULTIPLE PRECISION GRINDING *Cuts* PRODUCTION COSTS

Mass production can be applied to precision grinding only with equipment whose design incorporates simple, automatic precision controls. The Fitchburg method works on a new principle, far superior to other methods.

"Brain center" of multiple precision grinding, the Fitchburg Bowgage Head is a completely self-contained and independent grinding unit. It can be installed *singly* on standard equipment in any position and at any angle 0° to 90°, or in multiples to operate simultaneously or consecutively in mass production.

Fitchburg design gives greater accuracy, finer finish, speedier operation, at less cost per piece. See *how* Fitchburg Bowgage heads, standard and interchangeable, save your investment for the re-conversion period. Write today for information on how its cut-cost features can be applied to the precision grinding jobs in your plant.

THE HEAD. *The Bowgage Head* is a completely independent precision grinding unit. It has rapid traverse, slow grinding feed, grinding dwell or spark out, and rapid return to starting position — all started by one push button. It is precise to .0002", minimizing spoilage. It can be removed and remounted for other work, if operations are changed.

THE BODY. *This Special Fitchburg Double-Head Machine* grinds track roller shafts for caterpillar-type tractors. Two grinding wheels plunge-cut the diameter, after which both wheels travel toward each other to grind the shoulder of the shaft — *all in one set-up — with standard Bowgage Heads.*

Write Today for Catalog—Sent Free Upon Request

FITCHBURG GRINDING MACHINE CORP.

FITCHBURG, MASSACHUSETTS, U. S. A.

Manufacturers of—Bowgage Wheelhead Units, Multiple Precision Grinding Units, Spline Grinders, Cylindrical Grinders, Gear Grinders, Both Full Universal Grinders and Special Purpose Grinders

For Mr. Webster's dictionary . . .

A new definition of fidelity

fi·del'ity (fi·del'i·ti), *n.*; *pl.*—TIES (-tiz). [F. *fidelite*, fr. L. *fidelitas*]. **1.** Faithfulness; adherence to right; careful and exact observance of duty; or discharge of obligations. **2.** *Elec.* The degree to which an electrical device, as a radio receiving set, accurately reproduces at its output end and the signal or wave forms received at its input end.

3. *Industry.* That degree of permanent dimensional accuracy through resistance to wear as demonstrated by Elgin-made sapphire gages.

INSTANCES:

At Stewart-Warner Corporation—an Elgin Plug Gage, showing less than .00001 inch wear, has delivered over 220,480 close tolerance gagings on a job which wore out *steel* gages after 300 gagings!

An Elgin *Ring* Gage, checking a shaft charged with grinding compound, has now exceeded 328,950 gagings against 150 pieces for high speed steel and 500 for tungsten carbide.

At American Perforator Company—an Elgin Plug Gage has delivered some 520,000 close tolerance gagings over a 14-month period on parts which wore out *steel* gages after only 1 day!

Elgin Sapphire dimensional fidelity saves man-hours, materials, money! Elgin Sapphire Plug and Ring gages are setting new and almost unbelievable records for resistance to wear. Chemically inert at normal temperatures, their gaging elements of sapphire do not rust, corrode, burr or become distorted with use.

Approaching the absolute in dimensional fidelity, Elgin Sapphire Gages help eliminate the waste of worn-gage rejects; thus they save man-hours, money and materials.

Detailed information on complete range of sizes, prices and other gaging items are available on request.

America's best equipped Sapphire Fabricator

ELGIN NATIONAL WATCH COMPANY

Sapphire Products Division, Benton Street, Aurora, Illinois, U.S.A.

Elgin Sapphire Products present many advantages for all these types of equipment: GAGES • THREAD GUIDES • EXTRUSION DIES KNIFE EDGES • SPRAY NOZZLES • SOFT WIRE DIES • BURNISHING TOOLS • PRESSURE VESSEL WINDOWS • WATCH CRYSTALS HONING STONES



ELGIN
Sapphire Gages
DIMENSIONAL FIDELITY IN GAGING OPERATIONS

For Smoother Performance



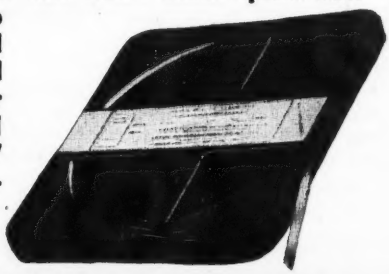
USE ATLANTIC Contour Cutting BAND SAW BLADES

You will welcome Atlantic Band Saws in your shop. The teeth are set to permit a smoother performance for radius cutting. The special alloy steel insures longer wear *and* you can weld them easily.

IMPROVED PACKAGE

One of the strongest, most practical and convenient boxes on the market. Cutaway feature shows inventory at a glance.

Box is solid chipboard construction that won't come apart. Saw securely held in coil form, no bothersome wires to cut. Required lengths freely removable. Marked on end as well as top of box for easy identification. Packed in all widths 3/32" to 1/2" wide in 100' lengths. Number of teeth as permitted by W. P. B. ruling.



Send for Atlantic Band Saw Booklet

ATLANTIC SAW MFG. CO., Inc.

Manufacturers of Metal Cutting Band Saw Blades Exclusively

155 Brewery St., New Haven, Conn.

VERS · O · TOOLS

with

Circular Chasers

– CUT CLEANER THREADS
– LAST LONGER
– SAVE TIME

1 Class 3 precision holds throughout long runs. Reground chasers quickly inserted without disturbing the setup.

After replacing chasers,
THE FIRST PIECE IS PRODUCTION

2 Chasers last longer, because they may be reground through 270° circumference. Ten to fifty times longer chaser life.



3 Time saved, because replacing chasers is a two-minute job. No trial runs needed.

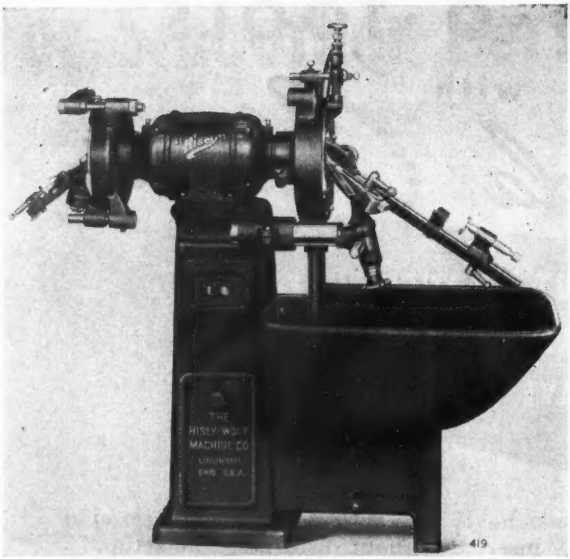
Ground Thread Circular Chasers and Circular Cutters, used with the Vers-o-tool Head, do all these precision jobs—thread cutting, end turning and forming, knurling, burnishing, combination threading and turning.

Catalog D-42-B gives complete details.

The NATIONAL ACME CO.

170 EAST 131st STREET · CLEVELAND 8, OHIO

Acme-Gridley 4-6 and 8 Spindle Bar and Chucking Automatics · Single Spindle Automatics · Automatic Threading Dies and Taps · The Chronolog · Limit, Motor Starter and Control Station Switches · Solenoids · Centrifuges · Contract Manufacturing



Small holder on left end of machine adapts drills from No. 60 to 3/8 inch for dry grinding.

Large holder on right end of machine is for the larger drills up to 2½ inches. Can be used wet or dry.

Machine can be furnished without pump and pan for strictly dry grinding. Other machines can also be furnished for small drills up to 3/8 inch; intermediate sizes up to 1¼ inch and larger sizes up to 2½ inch.

LARGE or small?

Small drills cannot be ground accurately on a machine designed for large drills. This Hisey Grinder has two holders—one for drills from No. 60 to 3/8 inch and one for the larger drills up to 2½ inch. The large holder permits variation of the point angle and also the clearance angle can be varied to suit the metal being drilled. The large holder will adapt drills with 2, 3 or 4 flutes, flat drills or flat twisted drills and drills with oversize shanks. Large reservoir with settling chamber assures ample supply of coolant. Inexperienced operators can easily learn to grind any size or type drill quickly and accurately.

Write for Catalog 70A

Hisey THE HISEY-WOLF MACHINE CO
CINCINNATI, OHIO

BATTLE WEAPONS!



Billings WRENCHES

IN THE HANDS OF THE "KNOW HOW" MEN

The achievement of industry's skilled workmen during this war is legend. Their "know how" has accomplished the, heretofore, impossible. Their wise selection of dependable tools is typical of American workmen. They like Billings Wrenches.

TOOL CRAFTSMEN SINCE 1869

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Billings

Buy Billings Tools from your Industrial Supply Distributor.

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HARTFORD 6, CONN., U.S.A.

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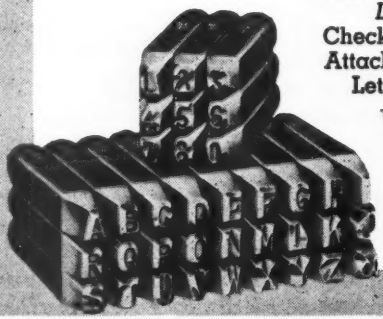
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CARBIDE TOOLS & DIES
"The World's Finest Carbide"

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TANTUNG CAST ALLOY TOOLS
"The Miracle Tool Metal"

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VASCOLOY-RAMET CORPORATION • North Chicago, Illinois

now available



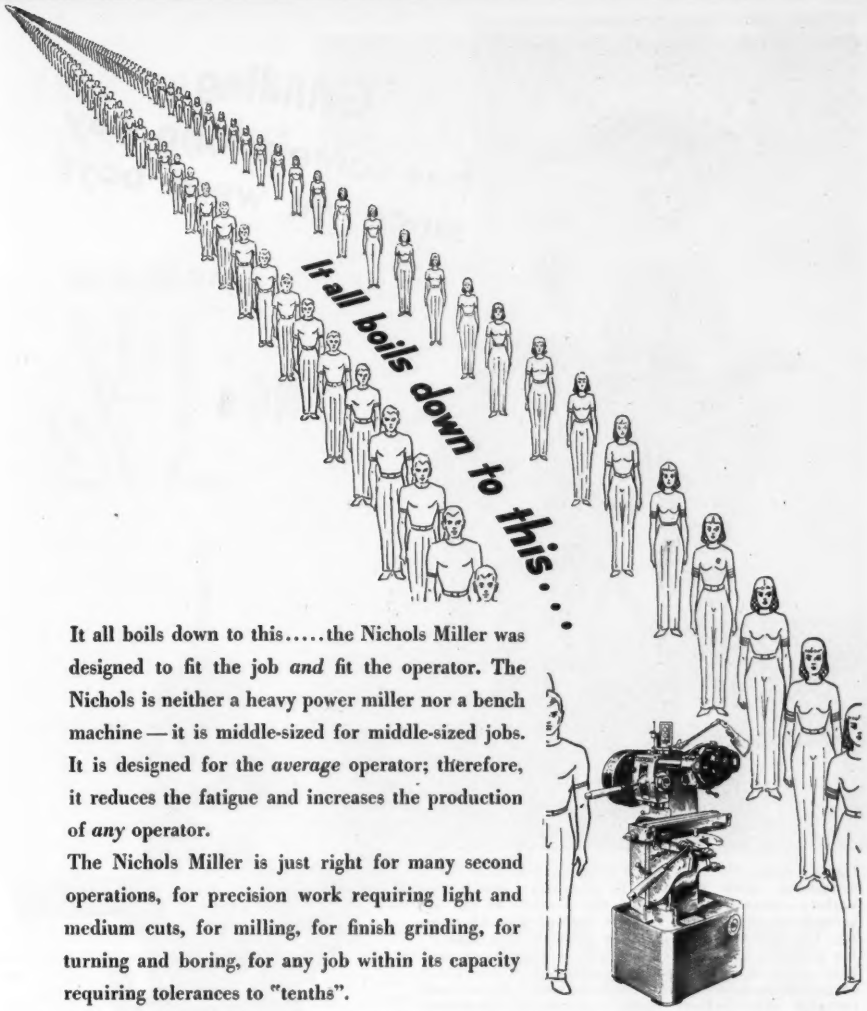
FULL INFORMATION on the

"most versatile machine in the shop"

Just off the press—a new catalog on the complete line of Pratt & Whitney Kellerflex Flexible Shaft Machines. Besides details on the different Kellerflex models and their applications, this catalog pictures and describes the various handpieces and attachments, illustrates some of the hundreds of accessories available and how they are used. You will probably discover additional places where the P&W Kellerflex can speed up production, save money. A copy will be sent you upon request.

WRITE TODAY FOR YOUR COPY OF THIS NEW CATALOG

PRATT & WHITNEY
Division NILES-BEMENT-POND COMPANY
KELLERFLEX SALES DEPARTMENT
WEST HARTFORD 1, CONN.



It all boils down to this.....the Nichols Miller was designed to fit the job *and* fit the operator. The Nichols is neither a heavy power miller nor a bench machine — it is middle-sized for middle-sized jobs. It is designed for the *average* operator; therefore, it reduces the fatigue and increases the production of *any* operator.

The Nichols Miller is just right for many second operations, for precision work requiring light and medium cuts, for milling, for finish grinding, for turning and boring, for any job within its capacity requiring tolerances to "tenths".

If your precision work requires short cuts, it requires Nichols precision and speed.



This new catalog on the Nichols Miller is free for the asking.

ni

THE *Nichols* MILLER

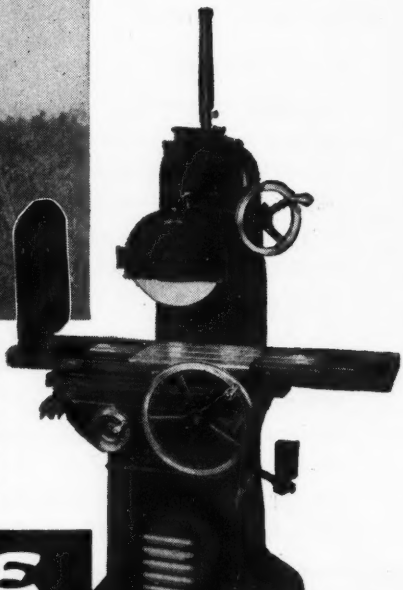
MANUFACTURED BY W. H. NICHOLS & SONS, WALTHAM, MASSACHUSETTS

NATIONAL DISTRIBUTORS: NICHOLS-MORRIS CORP., 40 CHURCH ST., NEW YORK 7, N. Y.



Grinding has come a long way since we were boys

ABRASIVE NO. 1½



The *Abrasive* No. 1½ Hand Feed Surface Grinder is producing work today — in accuracy, speed and variety—that is as far from the product of the old grindstone as walking is from flying! The *Abrasive* No. 1½ is a versatile machine with unusual capacity for grinding dies, flat work and gauges . . . it combines accuracy with speedy production. Convenient, large handwheels make operation easy; motor built integral with wheel head completely eliminates belts, sprockets and chains . . . minimizes vibration. *Abrasive* design assures years of satisfactory service.

ABRASIVE

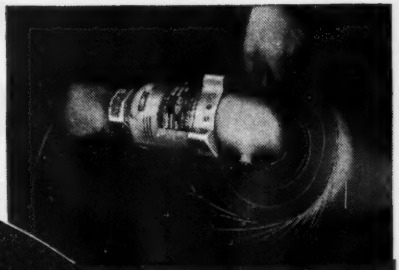
ACCURACY BOOSTS PRODUCTION

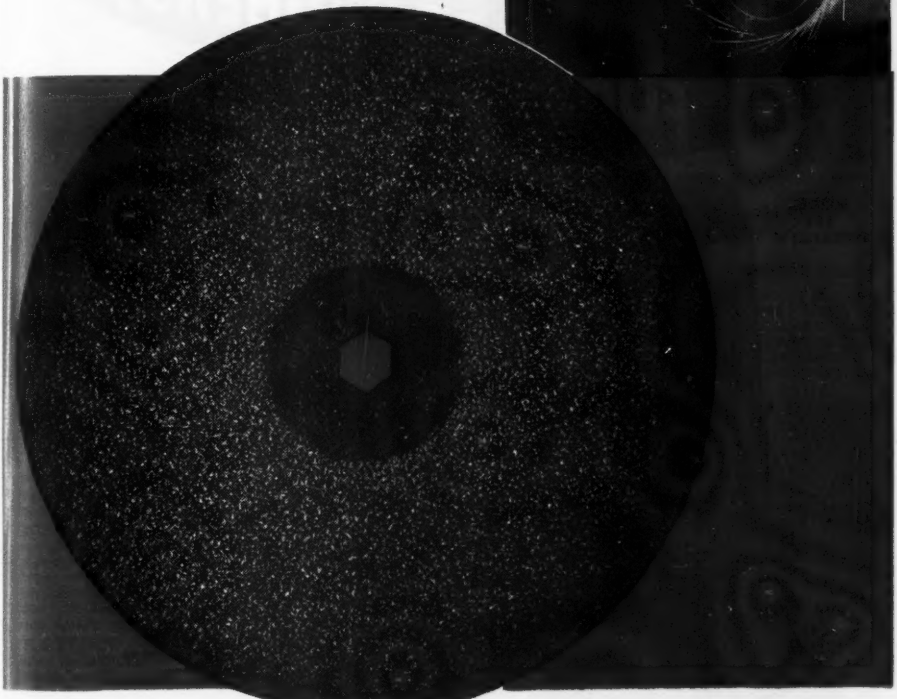
Capacity: 15" long, 10" wide, 12" high

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ABRASIVE MACHINE TOOL CO. • EAST PROVIDENCE 14, R. I.

EASY ON OPERATOR
FAST ON THE JOB





Tough sharp grains of tempered aluminum oxide are combined with heat resisting phenolic resin on a resin impregnated fibre backing to make this moisture-proof, fast-cutting, longer-life disc.

Even with continuous cutting action, this sanding disc will run cool and clean. It reduces the drudgery of sanding jobs and saves time. It has amazing flexibility for concave, convex and reverse curve sanding.

Ask Your SIOUX Distributor or Write Us

SIOUX
PHENOL ABRASIVE
DISCS

STANDARD THE WORLD OVER

ALBERTSON & CO., INC. SIOUX CITY, IOWA, U.S.A.

QUICK MARKING FOR PART NUMBERS!

MODEL 175 HYDRAULIC



MARKING BY ROLLING IS *FAST*- ECONOMICAL

War plants are finding this machine one of the best investments in time-saving and accuracy obtainable. Inexperienced help is able to turn out perfect markings every time on components of military equipment; which means that your peace-time products will be able to keep pace with the expected highly-competitive post-war markets.

- ***Rapid and Accurate***
- ***Flat and Round Surfaces***
- ***Lettering and Graduations***
- ***Eliminates Noise and Errors***
- ***Saves Parts, Labor and Stamps***

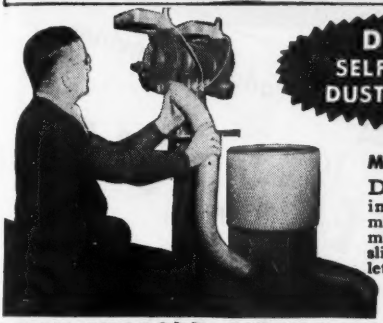
This machine will mark an unlimited variety of shapes and sizes when equipped with proper tools and fixtures. It will also do an excellent knurling job on solids and shells of small diameters.

Designed and Built by

GEO. T. SCHMIDT, INC.

1806 W. BELLE PLAINE AVE.
CHICAGO • 13 • ILLINOIS

Quick way to STOP DUST!



DUSTKOP SELF-CONTAINED DUST COLLECTORS



MODEL 600
DUSTKOPS are installed in a few minutes. Flexible metal hose makes slip fit with dust outlets on grinder.

MODEL 950
This unit, with dust hoods, "ready to go," fits any double-end pedestal grinder not already equipped with wheel guards and dust outlets.

DUST STOPPED ON ALL ABRASIVE OPERATIONS AT LOWEST COST

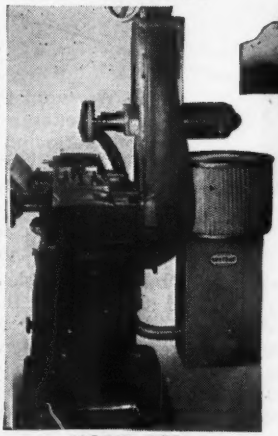


MODEL 600
With flat, spun glass filter for compact bench installation. Pulls all dust from two grinder wheels.

For quick, economical, effective, dust control *at the source*, install DUSTKOPS. Easy to attach to surface grinders, disc grinders, cutter and tool grinders, flexible shaft grinders—or to buffers, sanders and abrasive cut-offs—whether single or multiple units. Large or small models available.

DUSTKOPS are compact and portable. Entirely self contained, with motor, fan, cyclone separator (in all but smallest models) and spun glass filter. Flexible metal hose permits quick installation.

DUSTKOPS clean the dust-laden air without wasting heat. Efficient cyclone separator provides low maintenance. Many other features make DUSTKOPS ideal for your shop or laboratory. Immediate shipment of "standard" voltage units.

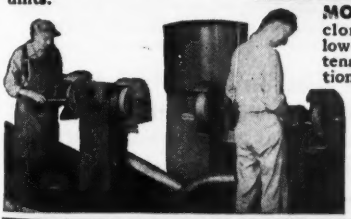




MODEL 950—has cyclone separator, plus spun glass filter. For medium duty work of all kinds.



MODEL 950—with cyclone separator means low first cost, low maintenance, even on production surface grinder.



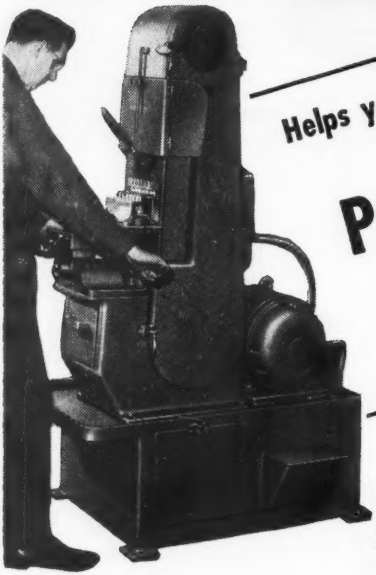
(Left)
MODEL 1250—one unit handles dust from four wheels.

MODEL 1250—gets all dust and smoke from this heavy duty abrasive cut-off, at extremely low cost.

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AGET-DETROIT COMPANY
604 First National Building • Ann Arbor, Michigan
Detroit Office: Tel. CAdillac 3090

Free METHODS ENGINEERING SERVICE...



Helps you get ALL the Production Savings From

PORTER-CABLE Wet Belt SURFACING

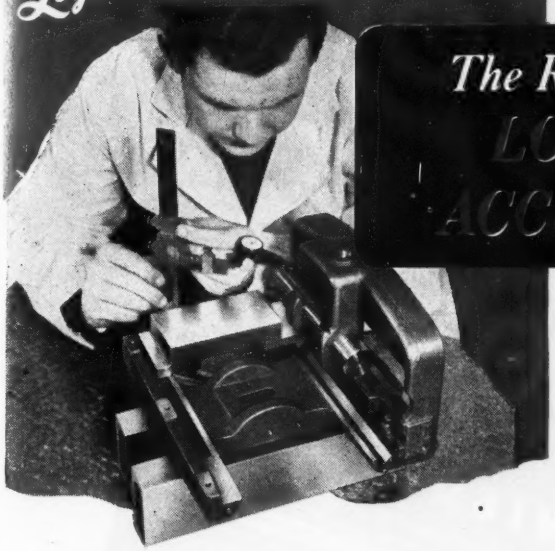
● We want to prove to you how much better our method will handle your surfacing problems than any other finishing technique you've ever employed! We want to prove that our way is faster, cheaper—easier to teach to new operators—easier to bring new operators to unprecedented peaks of production!

● Our Methods Engineering Service has been invaluable to hundreds of War goods producers. Now we want to extend it to industry that is feeling its way into the production of essential civilian goods. This service is available to you without cost—without obligation. Send us pieces typical of your surfacing problems—our abrasive experts will then submit to you a complete report—recommending methods—estimating times and complete costs for this operation. Here's an easy, reliable check on postwar production costs—available to you free. We believe that our story is so dramatic that it can only be proved in terms of savings on your own products! Send us your toughest, most challenging problem today!

- ★ **5 to 25 times faster than many common methods!**
- ★ **Removes metal and gives surface final finish at one operation!**
- ★ **Holds to closer limits, often .0005"!**
- ★ **Generates true arcs—cuts exact bevels—cleans up burrs!**
- ★ **Many operations performed freehand—most exact operations require only a simple jig!**

PORTER-CABLE MACHINE CO. **300-7 Wolf St. Syracuse, N. Y.**

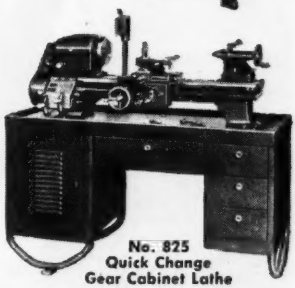
Logan A NAME TO REMEMBER WHEN YOU THINK OF BETTER LATHES



The Reason for LOGAN ACCURACY



No. 850
Manufacturing
Turret Lathe



No. 825
Quick Change
Gear Cabinet Lathe

Accurate work comes from Logan Lathes because accurate work goes into building them. Typical of maximum tolerances allowed are Bed ways within .0005″ of parallelism, and headstock bearing faces held to an accuracy of .0005″. To maintain such accuracy in lathe after lathe, one of every seven men building Logan Lathes is an inspector, skilled in the use of precision instruments such as Comparators, Johannson Blocks, Sine Bars, and the most accurate of gauges. Using this precision equipment, Logan inspectors check individual parts, sub-assemblies, and completed machines. They make certain, in short, that every Logan Lathe will *work* accurately because every part of that lathe *fits* accurately. This Logan stress on inspection, though costly, is also the wisest economy. Lathes which pass such rigid inspection make friends of the men who use them. Ask your Logan Lathe dealer, or write for full information on all Logan Lathes.

SPECIFICATIONS common to all Logan Lathes: Swing over bed, 10½″; Bed width across ways, 6-15/16″; Bed length, 43⅛″; Size of hole through spindle, 25/32″; Spindle nose diameter and threads per inch, 1½″—8; 12 Spindle speeds . . 30 to 1450 r.p.m.; Size of motor . . ⅓ or ½ h.p., 1750 r.p.m.; Preloaded precision ball bearing spindle mounting; Drum type reversing motor switch and cord; Precision ground ways, 2 prismatic "V" ways, 2 flat ways.

LOGAN ENGINEERING CO.

CHICAGO 30, ILLINOIS D-2

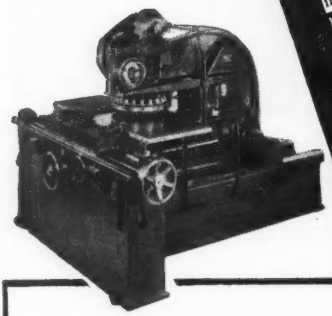
Check your cost on repairing punches or dies sheared through incorrect setups . . .

. . . then see a

WIEDEMANN

A Wiedemann Turret Punch Press handles short run piercing operations at long-run high speed and low cost . . . impossible to shear punches and dies. Why? Both upper and lower turrets are synchronized assuring perfect alignment of the punch and die. A positive locking device locks the turrets at the desired station so that the ram cannot be tripped until both turrets are locked into the desired position. There are from 11 to 32 punches and dies carried in the turret always ready for instant piercing.

Send for the complete story of short run piercing economy . . . Bulletin 92. Read how some users report savings up to 2000% in labor alone by using a Wiedemann Turret Punch Press.



WIEDEMANN MACHINE COMPANY

1821 SEDGLEY AVENUE • PHILADELPHIA 32, PA.

Canadian Representative: HOPE MACHINE CO., 21 KING ST., E., TORONTO 1, ONT., CONFEDERATION BUILDING, McGILL COLLEGE AVENUE, MONTREAL, QUEBEC

TEMPLATES ACCURATE TO ±.002" PRODUCED WITH A WIEDEMANN R-43 IN A FRACTION OF TIME TAKEN BY ORDINARY METHODS

New and revolutionary times have been set on accurate template making with the R-43 Micro Turret Punch Press.

The templates are punched, the hole size accurately maintained, and overall center distances held to ± .002". Two rotating turrets carry the required punches and dies, and thereby eliminate individual set up. A safety mechanism prevents tripping the press until the turrets are locked in alignment . . . shearing of punches and dies is eliminated.

No layout is necessary. Accurate lead screws, with direct reading dials graduated in thousandths of an inch, assure easy positioning and accurate dimensions.

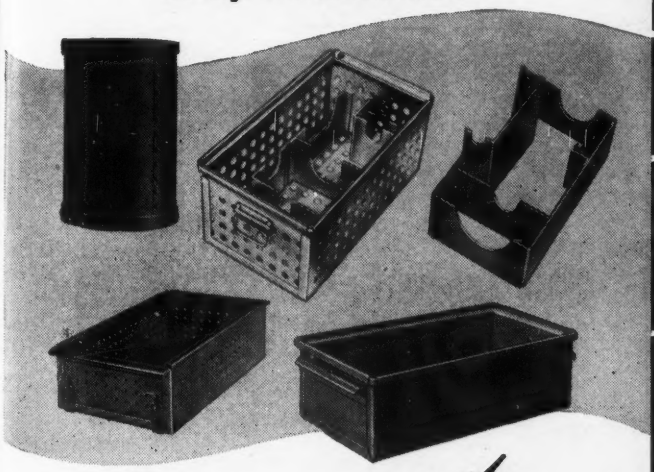
The lead screws operate at right angles to each other, are absolutely square with each other.

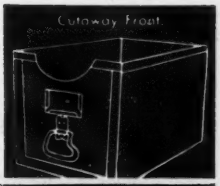
Dimensioning can be done from the ends of the template or from the center lines.

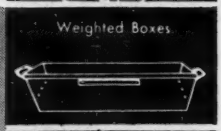
The Micro Turret Punch Press is a method of production whereby all elements necessary to produce accurate templates, inspection piercing templates and many types of flat drill jigs have been combined for maximum efficiency of motion and effort.

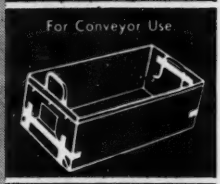
CUSTOM-BUILT

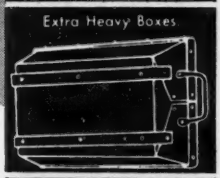
Shop Containers

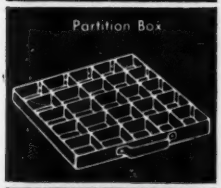


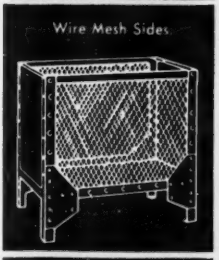


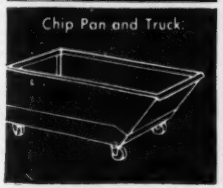












"they do so much for so little"

Of course, if one of our many stock sizes or styles will serve—all the better. But rather than compromise, since the uninterrupted daily flow of small products is involved, most manufacturers find specially designed containers a positive economy, the extra cost in most cases being trifling. The trend therefore, for many years has been strongly towards equipment individually designed and built for maximum utility.

Design Service. Avail yourself of our design service. Drawings, specifications, catalog and prices gladly submitted, without obligation or cost to you.

SHOP EQUIPMENT DIVISION
Cleveland Wire Spring Co.
5250 BROOKPARK RD. • CLEVELAND 9, OHIO

Cleveland
STEEL SHOP EQUIPMENT
STOCK STYLES FOR GENERAL UTILITY
BUILT-TO-ORDER to meet special requirements

Consult

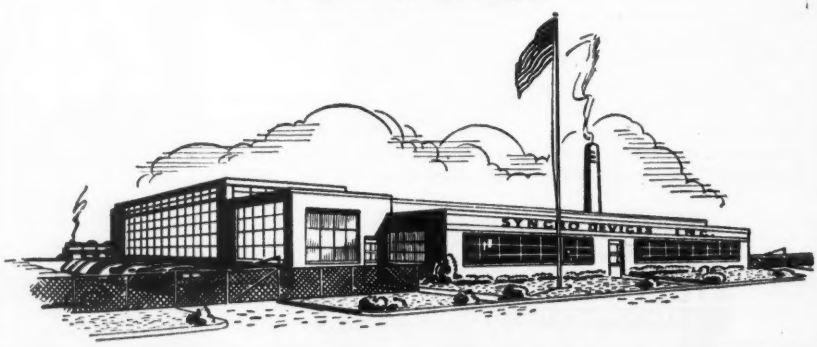
SYNCRO

the HOME of Precision and Production

SYNCRO specializes in the manufacture of precision machined products and in the solution of unusual engineering and production problems. The skill and experience of SYNCRO craftsmen is at your service—now and after Victory.

SYNCRO DEVICES, INC.

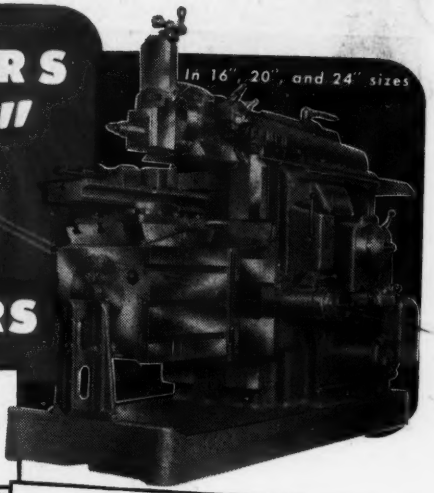
Ferndale 20, Michigan



1945



THESE 7 USERS "TELL ALL" ABOUT GEMCO SHAPERS



A Tool Room Foreman Says:
"We have two GEMCO Shapers in our Tool Room, and whenever I have a particularly difficult job to do, I always see that it is done on the GEMCO."

A Mfr. of Electric Motors Says:
"Our GEMCO Shaper is very satisfactory, and has proven its worth to us many times over."

A Mfr. of Electric Elevators Says:
"Your shaper has a wide range of feeds and speeds, and the down feed on the tool post, especially, has been a big help to us. Our machinists like the GEMCO Shaper better than the majority they have seen or used."

A Large Mfr. of Hand-Forged Tools Says:
"We are using a GEMCO to shape tough alloy steels to quite critical dimensions. We find the settings on the feeds accurate and easy to operate. Also, there is a definite saving in production time by the use of the motorized quick return on the table. And the "Lubrigard" safety is noteworthy as a feature to prolong the useful life of the shaper."

A Leading Mfr. of Files and Rasps Says:
"GEMCO features such as downfeed of head, finger tip touch of traverse, and your lubricating system, are perfect. Our next shaper will again be a GEMCO."

A Pump and Machinery Corporation Says:
"The men in our tool room are most enthusiastic in their praise of the GEMCO Shaper's performance and accuracy, which was not even approached by the older machine it replaced."

A Circuit Breaker Mfg. Co. Says:
"We have had this shaper about a year, and our tool makers are still talking enthusiastically about it."

GEMCO

Multi-Purpose SHAPERS

The Universal Type of GEMCO Shaper, shown above, is ideal for tool and die work, or where angular work set-ups are required. Check the following time-tested features: Exclusive "Lubrigard" Safety Device increases the precision life—Centralized Controls save time and effort, increase production—Large, easy-to-read dials—Wide range of feeds and speeds.

Write Today for Bulletin GC-125

GENERAL ENGINEERING & MFG. CO.

SAINT LOUIS 4, MISSOURI

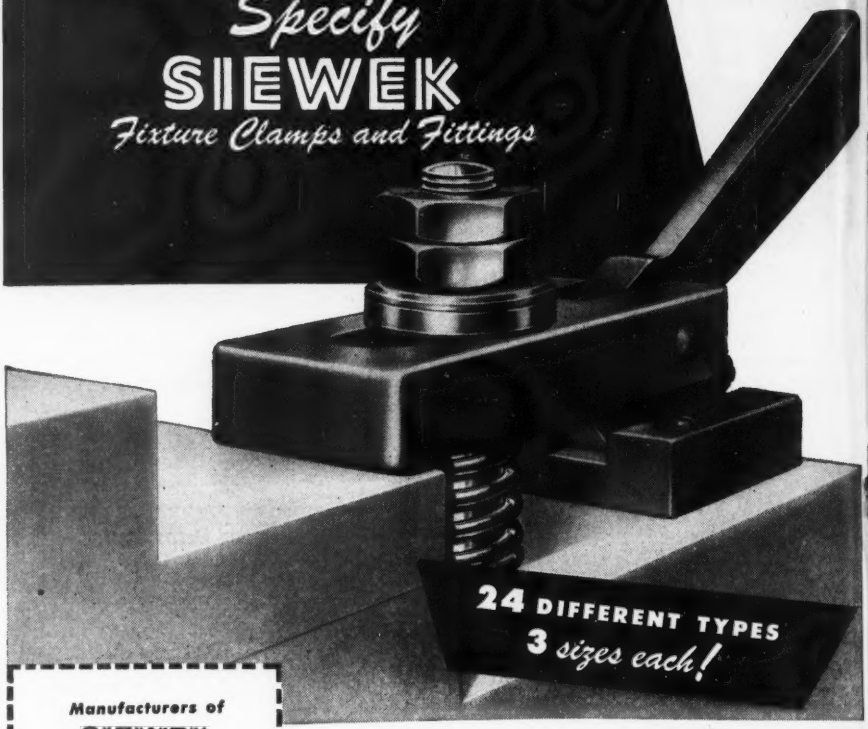
Save Designing Time

Specify

SIEWEK

Fixture Clamps and Fittings

DOMESTIC INDUSTRIES DI



24 DIFFERENT TYPES
3 sizes each!

Manufacturers of

SIEWEK

Rapid Clamping Drill Jigs



"Siewek Tools are Speeding the War Effort"

Nine times out of ten, Siewek Clamps can take the place of "specials." Save 50 to 75% of designing time . . . and much of the cost of production. Only a minimum of details are required in fitting Siewek Clamps to your work. Buy these complete assemblies for less than your cost of designing.

Rugged construction assures maximum strength. Uniform right angle pressure provides secure holding. Siewek clamp bars are heat-treated and hardened to give years of safe service.

Write today for full size template drawings for layout use.

SIEWEK TOOL DIVISION. DOMESTIC INDUSTRIES, INC.,

231 SOUTH LA SALLE STREET • CHICAGO 4, ILLINOIS • DISTRIBUTORS IN PRINCIPAL CITIES

The oil can's good for a "handy man"... the brush is fine for painting. the drip can is OK for knife sharpeners...
But for coolant applications, you'll get the most out of your machine tools with—

GRAY-MILLS COOLANT *Complete Portable* SYSTEMS



Gray-Mills Coolant Systems provide a simple, economical and efficient method of applying coolants or cutting oils on practically every machining operation . . . in controlled volume, either constantly or intermittently. They are easily installed and can be switched from one machine to another.

Applying coolants in this inexpensive, dependable way to machines not having a built-in-system, results in stepped-up production because it is possible to increase cutting speeds, tool life and improve finish.

You *will* get the *most* out of every machine with a Gray-Mills Coolant System—available in a variety of models, with pans and fittings.

Send for bulletins today!

GRAY-MILLS CO., 1948 Ridge Ave., Evanston, Ill.

GRAY-MILLS

Complete Portable

COOLANT SYSTEMS

FRACTIONAL H. P. PUMPS • PARTS CLEANING SYSTEMS
INDUSTRIAL FLUID REFRIGERATING SYSTEMS

THE UDYLITE
MULTIPURPOSE BARREL
FOR BULK FINISHING OF SMALL PARTS



● **The MULTIPURPOSE BARREL is designed to handle a one basket load. It loads and unloads easily and quickly—no hoist required and no doors to fuss with. Cup-shaped parts can be revolved at drain position for minimum dragout.**

All gears and bearings are above solution level. A choice of cathode fixtures assures constant, positive contact with any size or type of load.

This equipment is available in various combinations of cylinder and tank construction for tumble cleaning, electrocleaning or cyanide plating, acid plating, acid tumbling, rinsing or drying. It's just what you have been looking for. State your requirements when writing for prices.

THE Udylite CORPORATION
1651 EAST GRAND BOULEVARD
DETROIT 11, MICHIGAN
REPRESENTATIVES IN ALL PRINCIPAL CITIES

New! STANDARD

COMPARATOR
DIAL SNAP GAGE

PATENT APPLIED FOR

Lighter weight...Easy to handle

ACCURATE TO .00002"

Brings comparator accuracy to the machine. Light as an ordinary snap gage. Needs no special skill. Improves inspection and production.



Important Superiorities

Spherically surfaced upper anvil; flat lower anvil; no risk of out-of-parallelism. Flat shaped anvils available for checking close to shoulders.

Upper anvil wear-resistant cemented carbide; lower anvil cemented carbide tipped, with flat lapped serrated surface. Readily clears chips and dirt.

STANDARD Shockproof dial indicators furnished insure *superior* accuracy.

Insulated thermal grips; hand heat has little effect on gage setting.

Indicator may be turned to read from any angle.

.0001" graduations. Dependable readings to .00002".

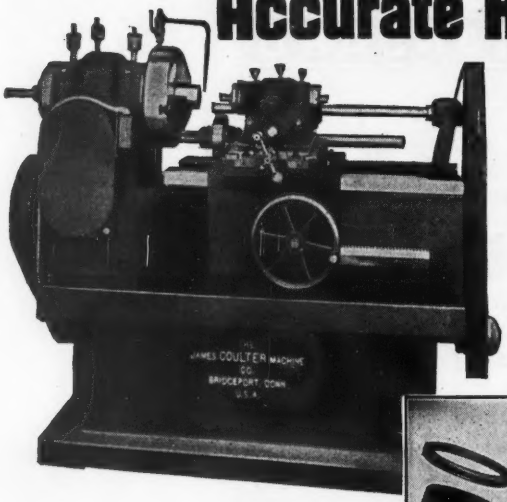
8 sizes cover range 0" to 8". First 3 sizes may be used in bench stand. Sizes over 8" to order.

Write for Special Bulletin

STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.

PRECISE ENGINEERING FOR PRECISION PRODUCTION

Accurate Hob Threading



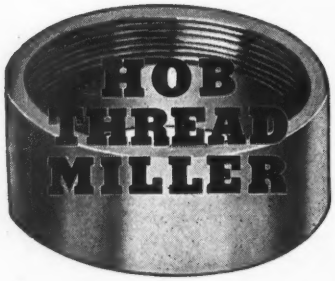
For Peace or War Work

RIGHT OR LEFT HAND THREADS

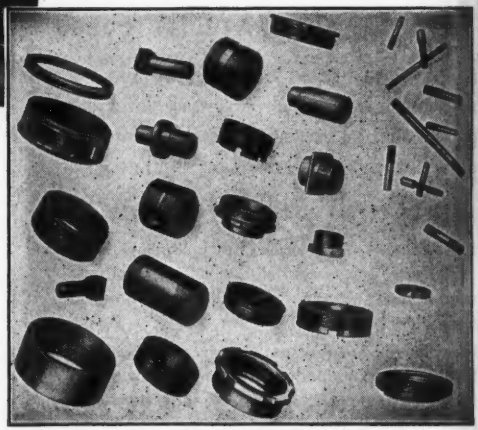
INTERNAL OR EXTERNAL

COULTER

Type "H"



Write for complete specifications



Any parts that can be held in ordinary chucks, air operated chucks, air operated collet chucks, or special face plate fixtures . . . can be threaded on this machine.

Set cam-controlled automatic cycle on first piece. Thereafter, cutter feeds into work to proper depth and at correct pitch and withdraws when cut is completed. Work and cutter spindles are driven by individual motors through worm drive, affording ample power throughout the wide range of feeds and speeds.

The James COULTER Machine Co.

BRIDGEPORT • CONNECTICUT • U.S.A.

MULTIPRESS

The 4-Ton Production Giant In Midget Form...



With Indexing Table

For High-Speed Production

Here's a faster, more accurate way to turn out small parts at *lower cost.*

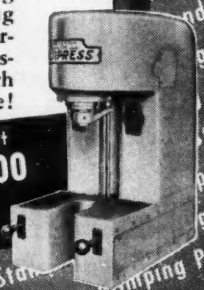
This is MULTIPRESS, equipped with one of its many standard accessories — a 6-station hydraulically driven indexing table.

Speed of the table is adjustable anywhere between 10 and 50 indexes per minute, and maximum pressure on the work can be limited anywhere from 1600 to 8000 pounds. Ram and table operate in positively interlocked sequence.

On continuous pressing and assembling operations, this unit literally *multiplies* production and increases precision — with maximum safety for the operator.

Multipress is a highly efficient bench-size, oil hydraulic machine tool, fully self-contained and easily portable — delivered ready to connect to your electric power source.

Other standard, ready-to-attach accessories include benches, extension tables, side shelves, straightening fixtures, automatic cycling controls, and an amazing Vibra-Pres control which permits short, rapid, exact-pressure repeat strokes in each complete ram cycle! Write!



THE DENISON ENGINEERING CO.
1153 Dublin Rd. Columbus 16, Ohio

Basic Unit
$575.00
Patents Applied For

HydrOILics BUILDING INDUSTRY'S RIGHT HAND

Facts

AIMED AT YOUR PRODUCTION SCHEDULES

HIGH SPEED AND ACCURACY IN AUTOMATIC PRODUCTION OF SMALL PARTS

Six to Eight different operations performed on each piece during single cycle of horizontal indexing dial.

•

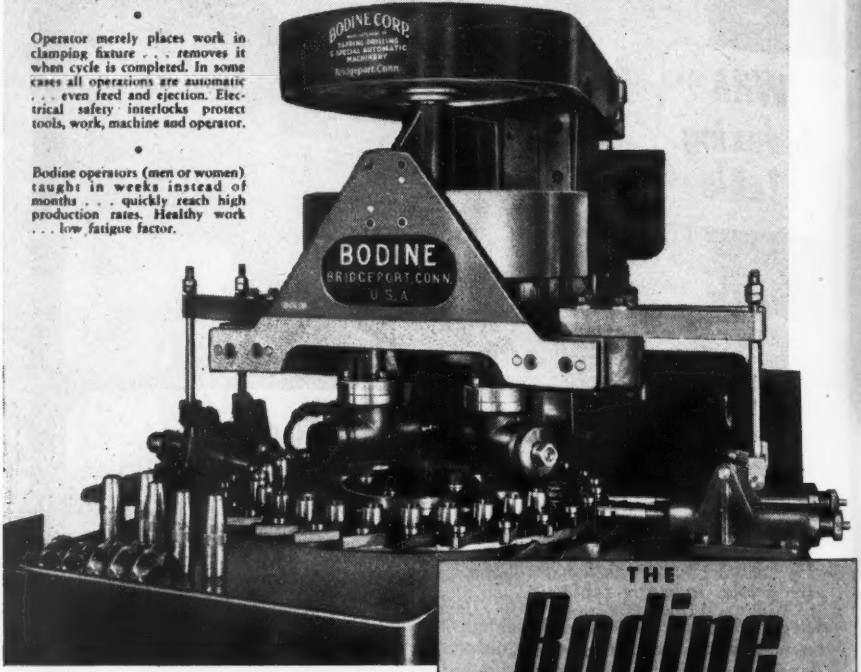
Spindles may be located to operate vertically, horizontally, at an angle, or inverted . . . each at different speed...to 20,000 r.p.m.

•

Operator merely places work in clamping fixture . . . removes it when cycle is completed. In some cases all operations are automatic . . . even feed and ejection. Electrical safety interlocks protect tools, work, machine and operator.

•

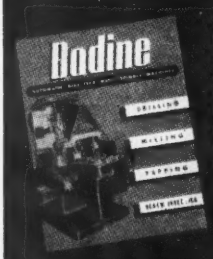
Bodine operators (men or women) taught in weeks instead of months . . . quickly reach high production rates. Healthy work . . . low fatigue factor.



THE **Bodine** CORPORATION

BRIDGEPORT • CONNECTICUT

AUTOMATIC DIAL TYPE DRILLING, MILLING, TAPPING, AND SCREW INSERTING MACHINES



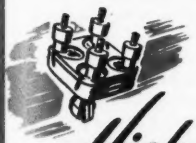
Send for Dial Machine BULLETIN. Fully describes 6 standard sizes, shows typical set-ups, explains operations. Complete engineering data. Recommendation from your blueprints or sample parts.

DRILLING, MILLING, TAPPING, SCREW INSERTING *Simultaneously*

THRIFTMASTER

Adjustable





THRIFTMASTER *Adjustable* Drillheads with 2 or more Adjustable Spindles are highly practical machine tools. Descriptive brochure on request.

High Production - Money Making

MULTIPLE SPINDLE DRILLHEADS

THRIFTMASTER

THRIFTMASTER PRODUCTS

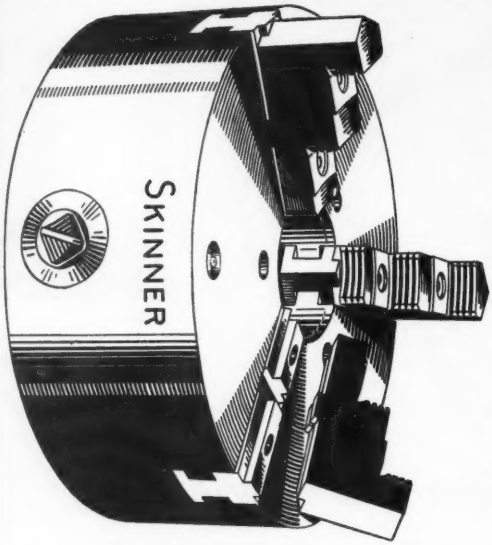
Division of

THOMSON INDUSTRIES, INC.

29-05 Review Avenue · Long Island City 1 · New York

SKINNER *Chucks*

MODELS, SIZES AND TYPES *for any machine and every job...*



SERIES **3900** SELF-CENTERING SCROLL CHUCK

Skinner 3-Jaw Self-Centering Scroll Chucks are made with the strength and accuracy required in modern production practice.

The Series 3900 illustrated has a forged steel body with heavy ribs to guide the jaws in their proper plane and is provided with Alemite fitting for lubrication of all moving parts.

All moving parts are made of suitable alloy steels properly heat treated for their respective functions. The jaw lands, steps and end bites are ground after assembly and tested to run within .003" total indicator reading.

Skinner self-centering chucks are made with either steel or semi-steel bodies and with 2-piece jaws or two sets of solid jaws. This type of chuck is furnished with flat back for threaded spindles or with taper seat backs for direct mounting on standardized taper spindle noses.

Write for new catalog No. 57 which gives complete information on all Skinner products.

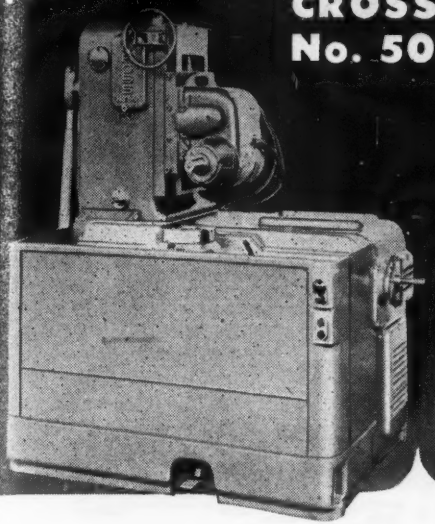
THE SKINNER CHUCK COMPANY SKINNER CHUCKS **340 CHURCH ST., NEW BRITAIN, CONN.**

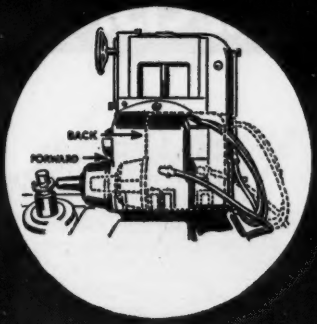


HAND & POWER OPERATED MACHINE CHUCKS—AIR CHUCK EQUIPMENT—FACE PLATE JAWS—MACHINE VISES

CHAMPION for CHAMFERING...

CROSS No. 50





CUTS ANY SHAPE ON ALL KINDS OF GEARS

VERSATILITY has made the Cross No. 50 Industry's champion gear chamfering machine—for small shops as well as large ones.

By means of an economical "pencil-point" cutter, the Cross No. 50 rounds, burrs and recesses all types of internal or external gear teeth.

And because of several exclusive Cross features, inexperienced or unskilled operators obtain smooth finish, precise spacing and accurate reproduction of form. For instance, the Cross Pitch Selector provides quick adjustment of a single cam for any tooth size and pitch. Average set-ups can be completed within 15 minutes. The work is clamped by means of foot pedal control, leaving the operator's hands free for loading.

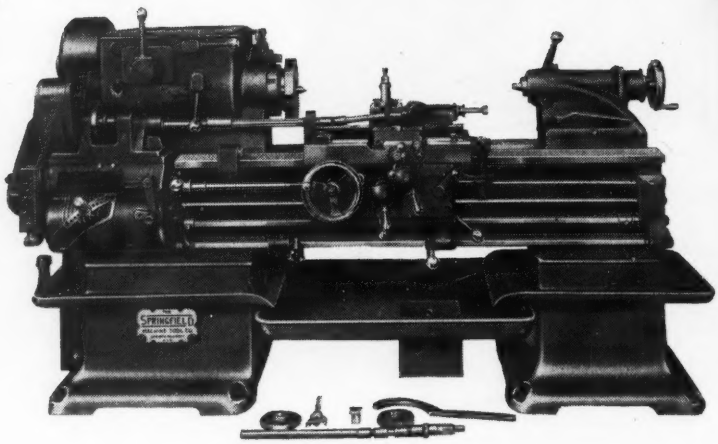
These and other features of the Cross No. 50 are described in a special folder which is yours for the asking. Just write The Cross Company, Detroit 7, Michigan.

CROSS

New York • Detroit • Chicago

Machine Tools

PRECISION and LONG LIFE



SPRINGFIELD Precision LATHES fill the munitions makers' demands for (1) extreme accuracy and (2) maintenance of this accuracy and long life.

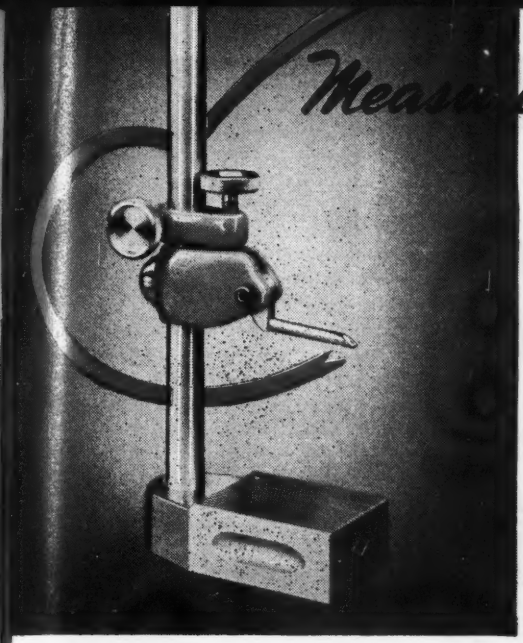
Here are some of the factors that account for the sustaining of the original accuracy built into each Springfield Lathe:

HEADSTOCK . . . 12 speeds . . . only half of the easy-shifting spur gears mesh at one time. APRON . . . extra heavy . . . operates on ball and bronze bearings throughout. TAILSTOCK . . . all bearings and bed ways oiled from one well.

The SPRINGFIELD LATHE is an outstanding value for both tool room and quantity production use. *Write for Bulletin 162.*

THE SPRINGFIELD MACHINE TOOL CO.

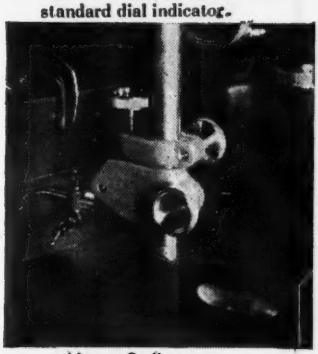
SPRINGFIELD OHIO



Measure Heights with Accuracy

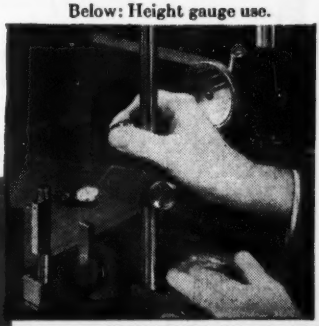


Above: Comparator use with standard dial indicator.



Above: Scriber use.

Below: Height gauge use.



● The Dickerman Height Gauge has a wide range of usage as a height gauge. comparator or scriber. It is ruggedly constructed. accurately machined and perfectly fitted for precision measurement.

This gauge can be used for fine settings due to the differential screw adjustment. Measurement in the tenths of thousandths is quickly and accurately attained.

Made in three column lengths — 10″ — 14″ — 18

Send for illustrated data folder.

H. E. DICKERMAN MFG. CO.

MANUFACTURERS OF DICKERMAN DIE FEED AND DICKERMAN HITCH FEED

221-31 ALBANY ST. ● SPRINGFIELD, MASS.

This
MILLING OPERATION
was
Made Easier
and
Quicker



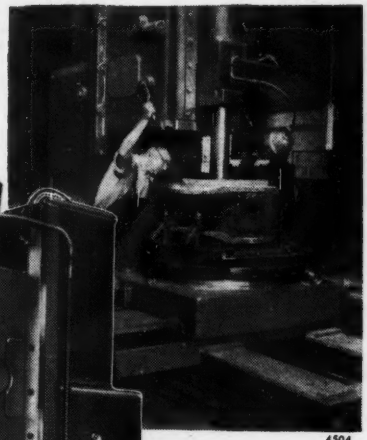
Work is held securely in fixture for milling operation by a De-Sta-Co 210 Clamp. This shows how the solid work bar can be bent to any desired clamping angle without the necessity of special tooling or parts. An exclusive De-Sta-Co feature.

De-Sta-Co Clamps are designed to simplify and expedite many production and assembly operations. Especially suited for jig and fixture building.

Complete range of types and sizes described in New Catalog No. 45. *Send for it.*

DETROIT STAMPING CO.
Established 30 Years
349 Midland Ave • Detroit 3, Mich.

TIME-SAVER ON ALL TYPES OF SLOTTING

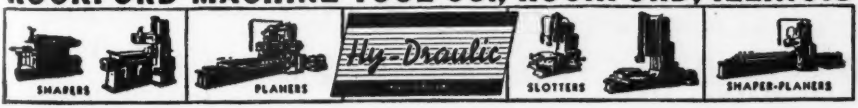


4504

The 36" stroke Hy-Draulic Slotter speeds up production of big heavy slotting jobs. Powerful and rugged, it is fast, easy to operate, efficient. The early installation shown at upper right saved some 40% on machining crown brass fits. Later machines make similar savings on a wide variety of work.

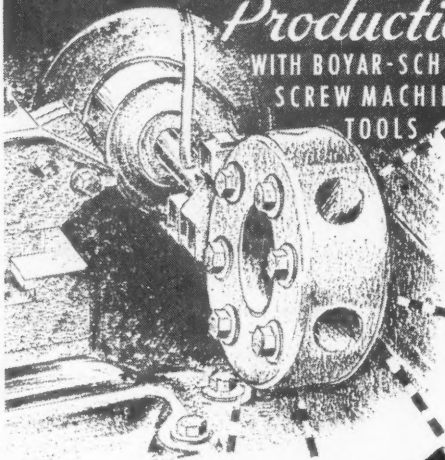
Some of the Hy-Draulic Slotter features that provide these operating advantages are: power rapid traverse in all directions; start, stop and jog buttons on handy pendant; centralized controls, built-in dividing head, tilting ram. These, and the basic advantages of hydraulic feeds, are described in a bulletin that will be sent to interested executives on request. Please ask for Bulletin 1622.

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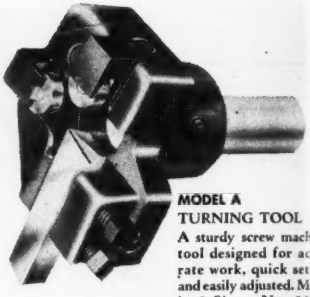
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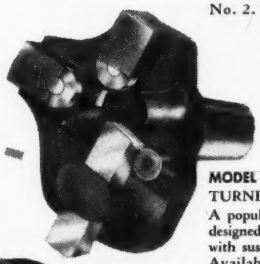


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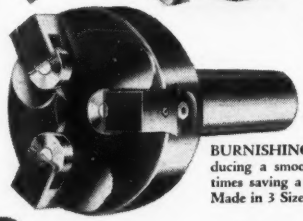
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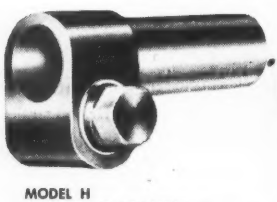
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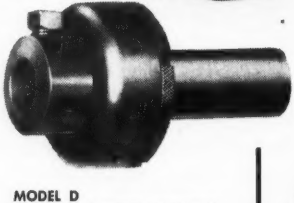
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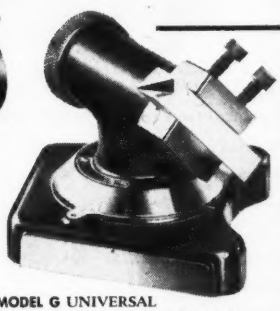
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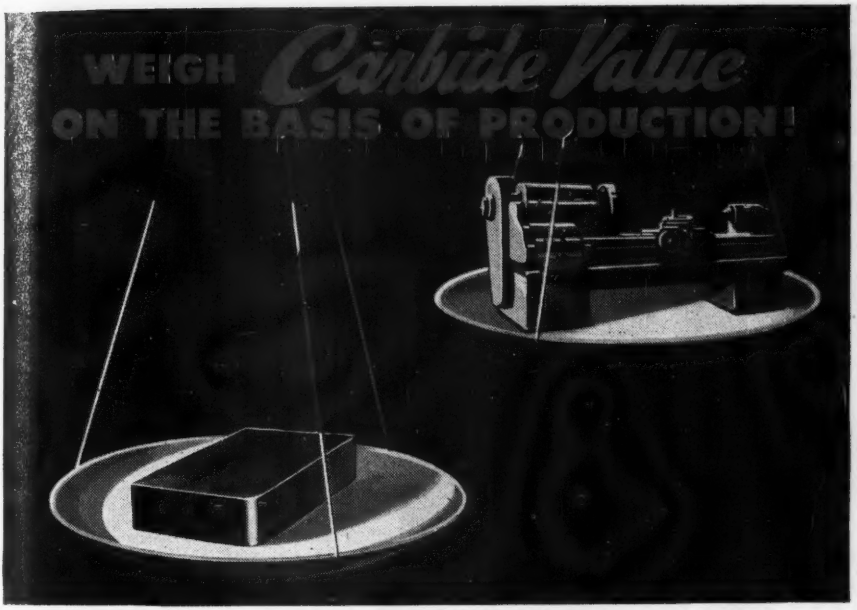


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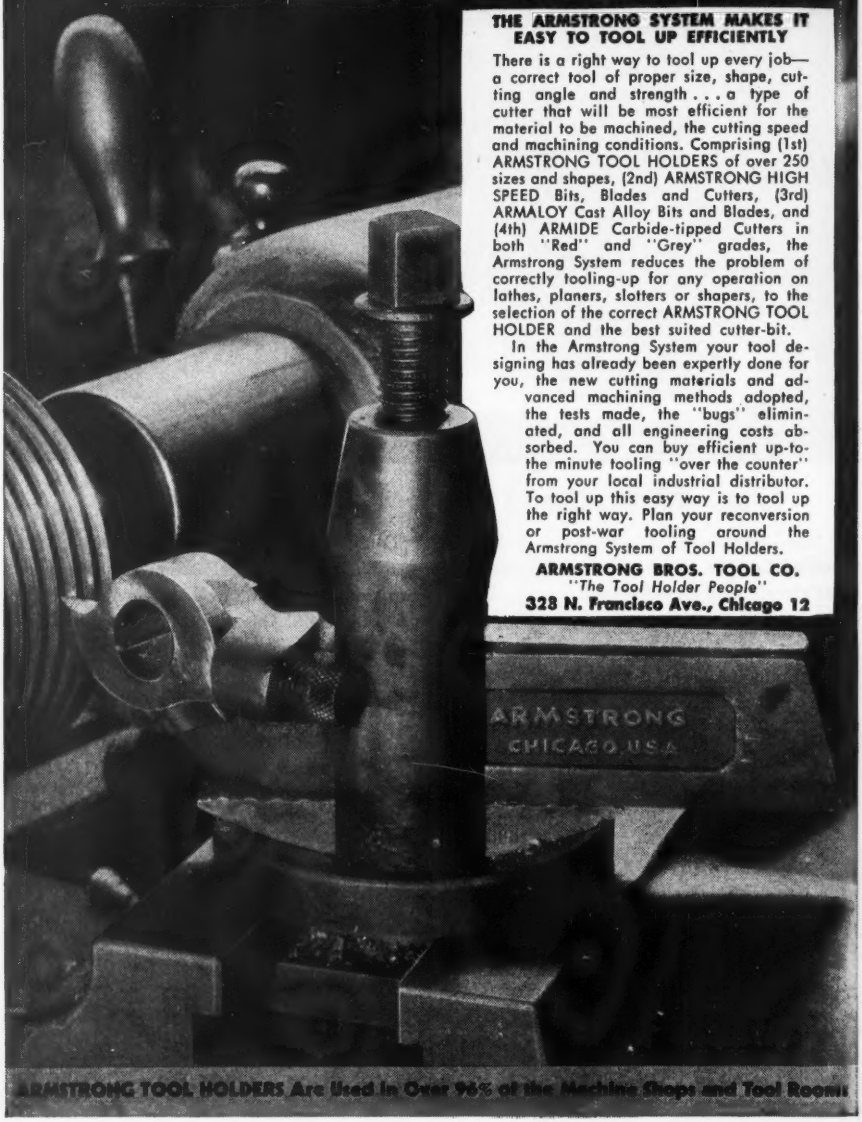
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JULY, 1945

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Fig. 1—View of a Ventura Bomber, Looking through the Fuselage Section of a Giant Lockheed "Constellation"

A concise description of the tools and methods used in the building of the Lockheed "Lightning" P-38.

By
HOWARD CAMPBELL
Editor,
MODERN MACHINE SHOP

Tooling For P-38 Production

NEXT to a ship, the airplane is the largest single manufactured article, and like the ship, in the earlier days of the aircraft industry each plane was practically built by hand. Some jigs were used—especially for wing construction—more in order to maintain the alignment of the members in these parts during construction than because of any need for high production. However, as plane construction became more systematized, the tooling became more standardized and when at the outbreak of the recent European war the need for American planes became obvious, American airplane manufacturers had a pretty good idea of what would be needed in the way of tooling to produce planes on a production basis. The tooling at Lockheed, with which this article deals, is an excellent example of this point.

As the need for American planes became more imperative aircraft tooling engineers began a systematic study of ways and methods for producing aircraft parts on production basis. Jigs were designed for practically all parts that required machining, and for assembly operations whereby the use of jigs or fixtures

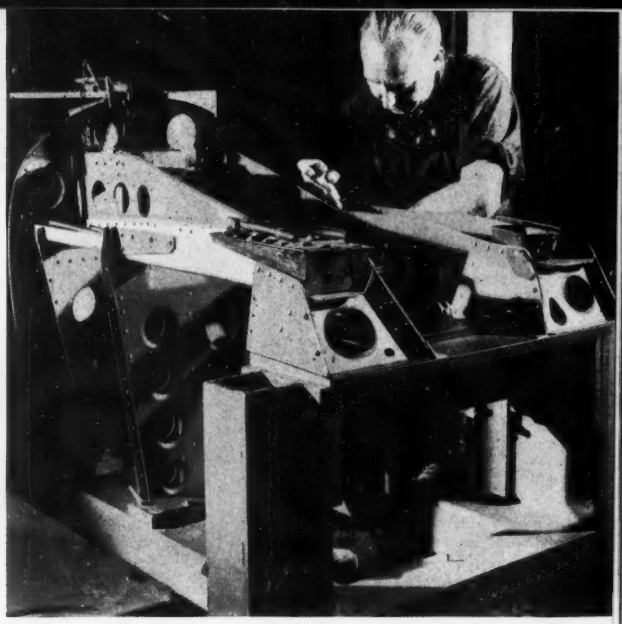


Fig. 2—Jigs are Used for the Construction of all Sub-Assemblies. Here an Operator is Shown Building the Armament Section for the Nose of the Fuselage

would simplify the task and make possible the use of inexperienced operators. Existing plants were completely overhauled and new plants designed and built in which the production lines were set up so that in the machine departments the pieces passed from one operation to the next without any more trucking that was absolutely necessary. In the assembly departments the progressive assembly system was used wherever possible and assembly lines for the sub-assemblies were laid out transversely with the main assembly line so that the sub-assemblies could arrive at the points on the main assembly lines at which they were to be used.

In the final assembly, platforms were built each of which could accommodate a complete plane and these platforms followed each other consecutively through three identical

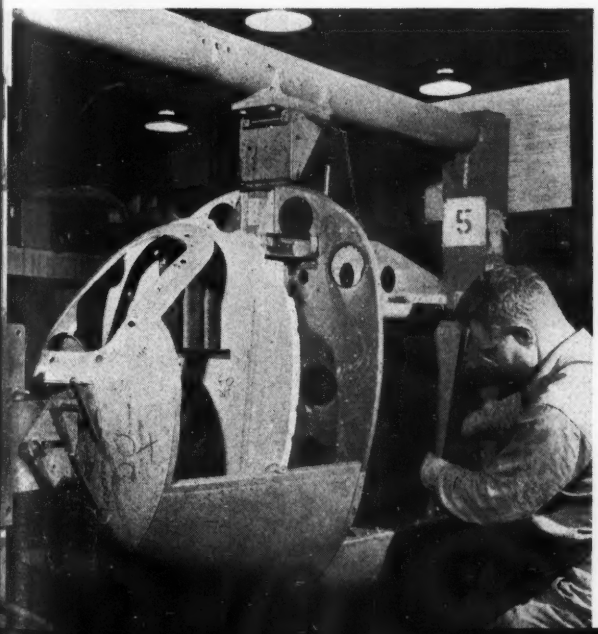


Fig. 3—In this Jig the Armament Section is Assembled to the Fuselage Nose. Sub-Assembly Jigs are of Rigid Construction, to Preclude the Possibility of Misalignment in Assembling

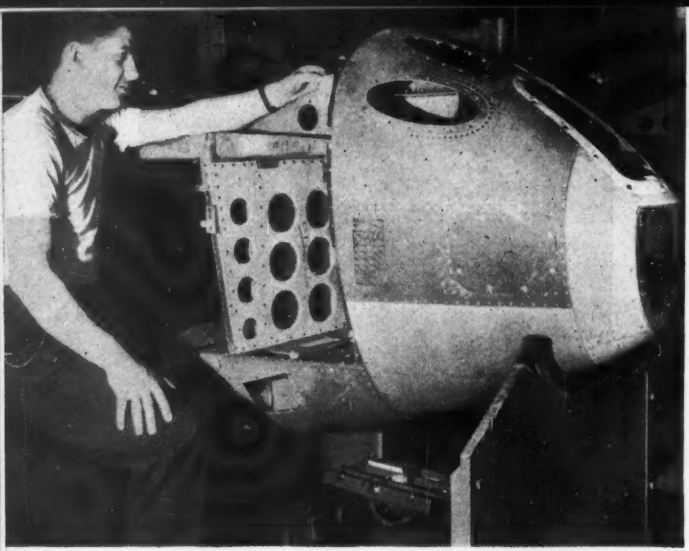
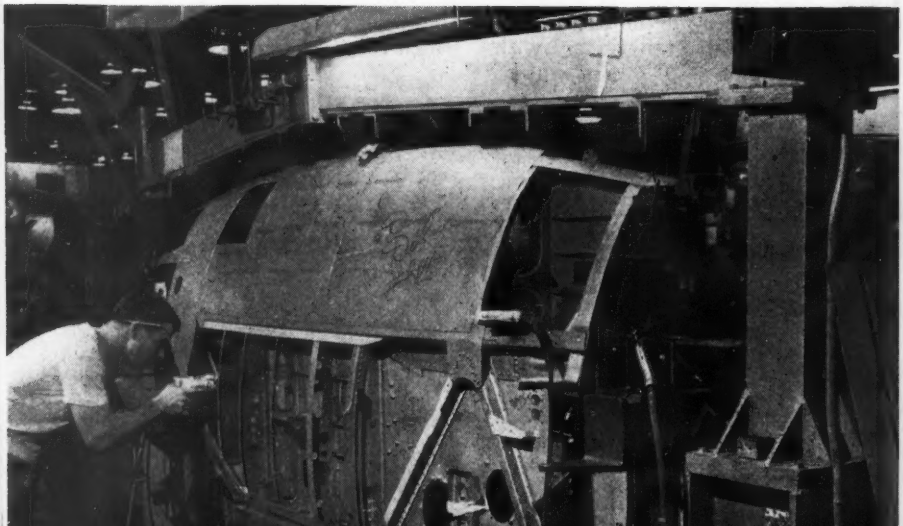


Fig. 4 — Completed Nose Section in Cradle, Ready to be Assembled to the Fuselage

production lines extending the whole length of the plant. In the floor in each production line a slot was made for a chain to be power operated quite like the cable that held the old-fashioned cable car. Each plat-

Fig. 5—Fuselage Panels are Built in an Upside Down Position. Note the Welded-Steel Box-Section Construction of the Jig. Such Jigs are Easily Disassembled and Reconstructed to Meet the Requirements of New Models



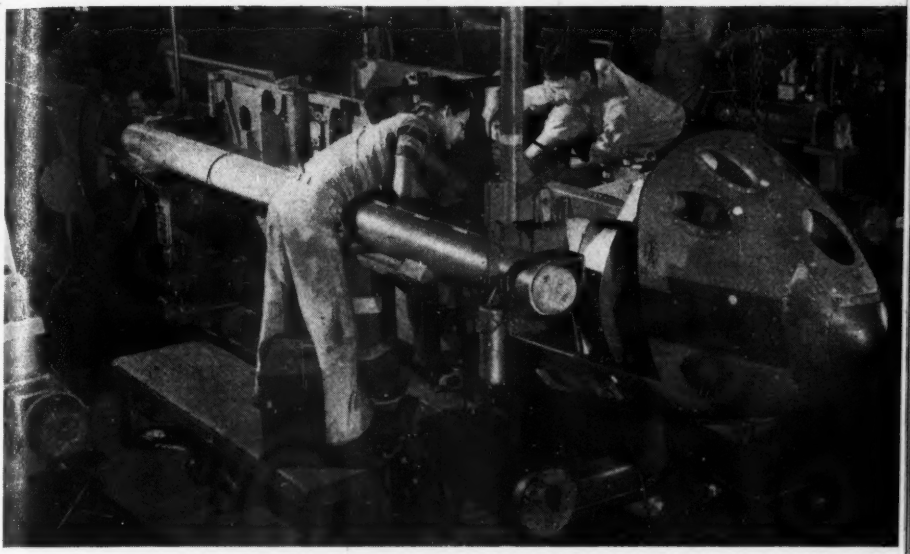


Fig. 6—The Nose and Side Panels are Mated in this Master Jig. Quick-Action Clamps are Used to Hold the Parts in Alignment for Assembling

form was guided by a guide wheel running in a groove formed by laying two lines of steel angles and the platform was moved by the simple expedient of using a push bar, one end of which could be dropped to engage a link of the chain, the other end bearing against a plate on the rear side of the platform. Thus the platform could be moved when required and could be held stationary by simply removing the push bar.

The photograph Figure 1 is a view of the completed Ventura Bomber looking through the fuselage section of the giant Lockheed Constellation. This illustration is included to provide some conception as to the variety of planes that are turned out by Lockheed.

Each section of the plane is assembled in its own jig before mating with other sections or other parts in the final assembly jig. In Figure 2 an operator is shown in process of building the armanent section which goes into the nose of the fuselage. To be sure that all parts are properly aligned and in the proper relation to each other, they are set up in a jig before being riveted together. All parts are drilled before coming to the assembly, but the use of the jig ensures that the parts will be anchored to each other in exact alignment.

After the armament section has been built, it is moved to the jig shown in Figure 3 where it is assembled to the fuselage nose, which has also been built in a jig in which all parts were properly aligned before being anchored to each other. These sub-essembly jigs are rigidly constructed to preclude the possibility of deflection and consequent error in the alignment of the parts to be assembleld.

Usually bolt holes are available in the component parts, which makes it

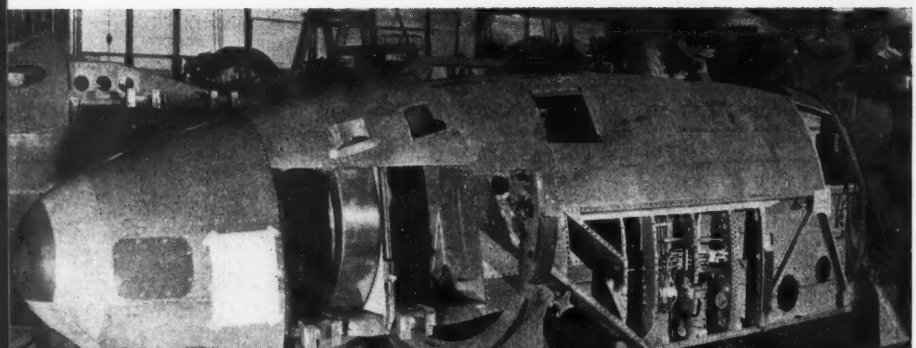


Fig. 7—Here the Fuselage is Shown in a Cradle that can be Revolved so as to Bring the Fuselage to any Position Required for Assembling the Smaller Components

possible to bolt jig sections to the components, the jig sections then being pinned to mating parts of the jig itself so that the component parts will be in the positions and alignment desired. A good example of this manner of holding the workpieces in the jig is seen at the left in the illustration where a jig part bolted to the fuselage nose is pinned to a corresponding plate on the jig by means of the T-handle pins. The T-handle pins are linked to the jig by chains which make it impossible for them to be carried off or lost.

In Figure 4 a completed nose section is shown resting in a cradle, ready to be assembled to the fuselage. These cradles are used to transport the completed assemblies from the work area to the next successive assembly station, and serve not only as a method of transportation, but also as storage racks for the sections while they are waiting to be used.

The building of the right-hand panel of the fuselage is shown in process in Figure 5. This panel is also constructed in a jig so that all parts will be held in correct relation to each other while in process of assembly, and the panel is built upside down for convenience in assembling.

The jig is built of pipe sections of square column castings, bolted together, with locating plates where needed in order to locate the fuselage parts correctly. The principal frame sections for this panel are first pinned in position with the aid of locating pins, then the wall sections are added and anchored in place with rivets and bolts until the entire section is completed. When finished, the locating pins are removed and the section is moved to the fuselage master jig for use in the final assembly of a plane.

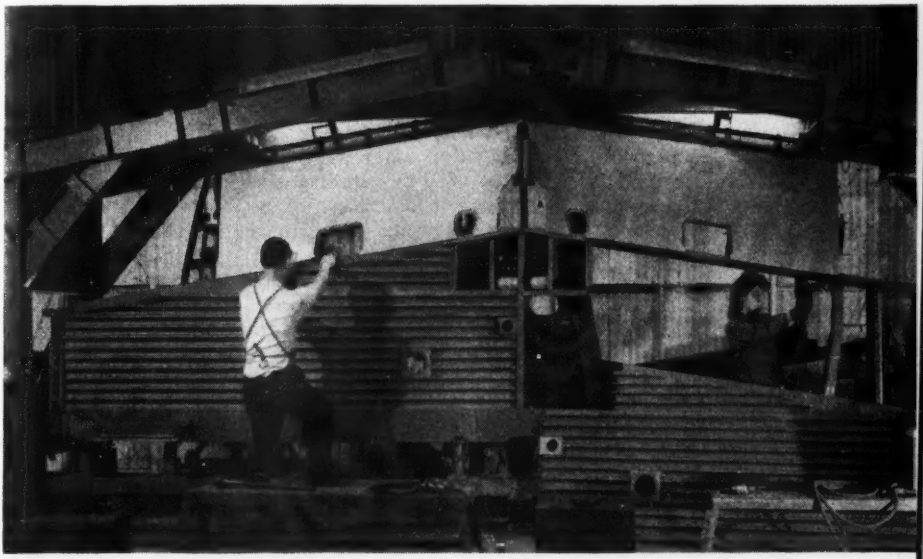
The illustration Figure 6 shows the fuselage master jig in which the nose and side panels are mated. This jig is a rigid structure, which is necessary to maintain alignment. Large horizontal and vertical jig members ensure rigidity at all times. Quick action clamps are used to hold the parts in the jig for assembling.

The fuselage is built in an upside down position, as shown, for convenience in assembling. Note the ports in the nose for four 50-calibre guns and a 20-mm. cannon. When the fuselage leaves this section it is practically completed. After the fuselage has left the section shown in Figure 6, it is moved to the position illustrated in Figure 7, where the smaller parts are attached to the fuselage in a revolving cradle which makes it possible to get at parts of the fuselage which would otherwise be inaccessible. When the fuselage is finished, it is moved, by means of the casters under the frame, to the final assembly line.

The cradle consists essentially of a platform on casters carrying a large ring that rides on rollers so that it can be revolved, a frame at the rear end of the cradle carrying a small roller bearing section to which the rear end of the fuselage is bolted. The large ring is in halves, hinged, so that it can be opened to remove the fuselage upon completion.

The illustration Figure 8 shows the operation of fabricating the center section trailing edges, which is also done in a jig to ensure correct alignment of the component parts. The frame and sheet metal parts are positioned by means of locating points on the jig and are then anchored together. Most of the holes are punched in the parts by machine, but there are always some that must

Fig. 8—Fabricating the Center Section Trailing Edges. The Parts are Positioned by Means of Locating Points on the Jig so that Perfect Alignment will be Maintained while They are being Anchored Together



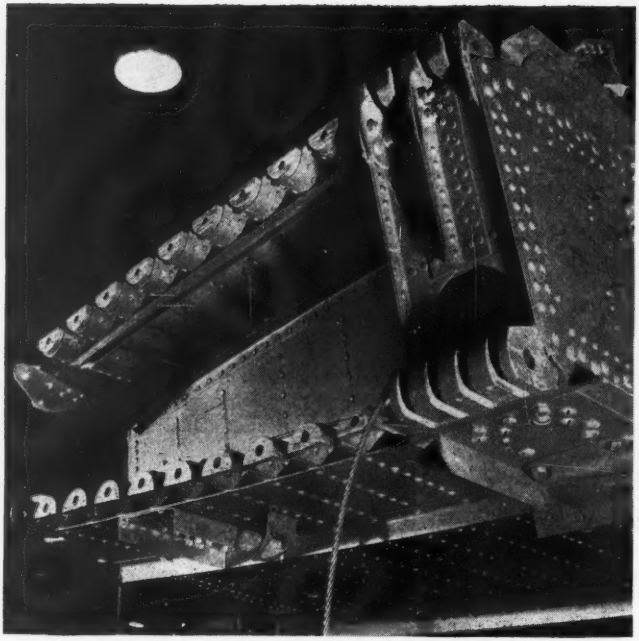


Fig. 9—Outer End of Center Section, showing Fittings by which the Wing is Joined to the Center Section. The Faces of the Fittings are Finish-Machined in Place

be drilled in place, which is done with a portable electric drill.

The jig is made of steel beams welded together and is set for dimensions which are determined by the over-all length of the main beam. Floating end slabs are adjusted to the over-all dimension. Dural expands and contracts with changes in temperature from day to day consequently the drilling of the final attaching holes in the trailing edge is left until this time so that no misalignment can occur between the trailing edges and the main beam.

With these two members held in accurate relation to each other, the intermediate section between the edges and the beam is built. This section consists of upper and lower corrugated pieces, commonly referred to as "corrugations," and the intermediate wing ribs in the main body of the center section and is completed in this fixture excepting for the front tanks. When this member comes out of the assembly jig, it goes into the pick-up cradle.

At the outer end of the center section on each side are the fittings by which the wing is joined to the center section, shown in Figure 9. The faces of these fittings are rough machined but are left unfinished until this point in the assembly is reached, when the fittings are finished with a jig and portable tool which provides for the necessary accuracy for a perfect joint with the outer wing panels. The machine used to machine the ends of these fittings consists of a high-speed air tool carrying an end mill. A set of hardened and ground tracks is anchored to the main beam to provide a smooth and accurate surface upon which the base of the routing tool rides so that the tool will cut smoothly and accurately. Powered by air, the tool operates at a speed of 50,000 r. p. m.

In Figure 10 an operator is shown using an air-operated routing tool to finish the mating surfaces on the fittings at the end of the center section for assembling the outer wing



Fig. 10—Using an Air-Operated Routing Tool to Finish the Mating Surfaces of the Wing-Connection Fittings

panels. To the air tool has been attached a heavy base which has been machined on the bottom surface. Clearance has been provided for the cutter. When the tool is in operation, it is moved by hand along the hardened and ground tracks so that the surface of the joint fittings can be machined accurately.

In the next operation on the center section, Figure 11, the section is moved into this assembly jig where the two front tanks are installed in position to properly align the large forged engine mount brackets. The inboard end of this section is properly aligned for the assembling of the fuselage later. All holes for mounting the fuselage are drilled after the

Fig. 11—In this Jig the Two Front Tanks are Assembled to the Center Section in Position to Properly Align the Engine Mount Brackets



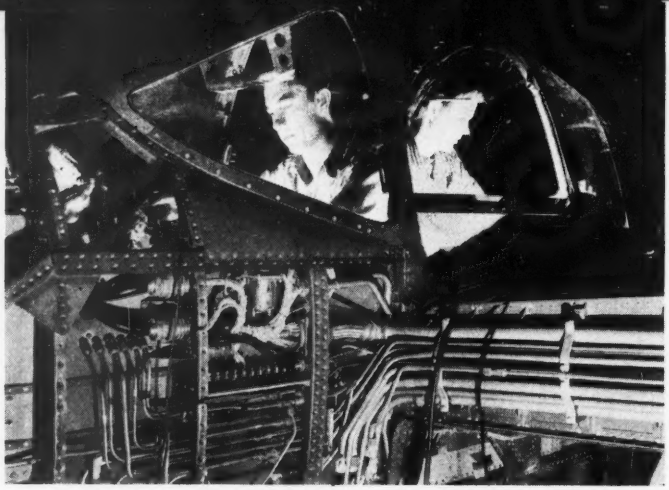


Fig. 12—Installing Instruments, Controls, and Radio Equipment in the Cockpit of a P-38

tanks have been completely installed. Any variables are checked by this method so that there will be no misalignment. At this time the corrugation fittings are drilled and reamed to size so that the wings will be properly aligned in assembling.

The jig is made of box beams, of such design that they can be disassembled and used again when the fixtures are redesigned for newer types of planes. Large gusset plates are used for strength, and all bearing surfaces are machined so that the parts of the jig can be fitted together in any combinations required. So far as possible, all parts of the jig are standardized.

The illustration Figure 12 shows two of the workers busy on the cockpit installing the instruments, controls, and radio equipment. The mating and assembling of the fuselage



Fig. 13—Mating the Fuselage and Center Wing Section. The Wing Section is Suspended from an Overhead Electric Crane

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and center wing section is shown in Figure 13. The section is handled by overhead electric crane and is carefully "nursed" to that exact spot required for assembling. When properly located it is temporarily anchored with a couple of bolts which hold it steady until the riveting can be completed.

(The concluding section of this article will be published in the August issue of MODERN MACHINE SHOP)

"Milling Cutter Data," a book for users of standard and special milling cutters, is announced by the Barber-Colman Co., Rockford, Ill. The book is based on performance data gathered directly from the field concerning jobs where specialized engineering has aided solving certain production problems.

Distribution of the book is intended for key men engaged in active production and tooling requiring the use of milling cutters and special tools. It is issued without charge upon receipt of a formal request on a company letterhead and signed by a person in a key position.

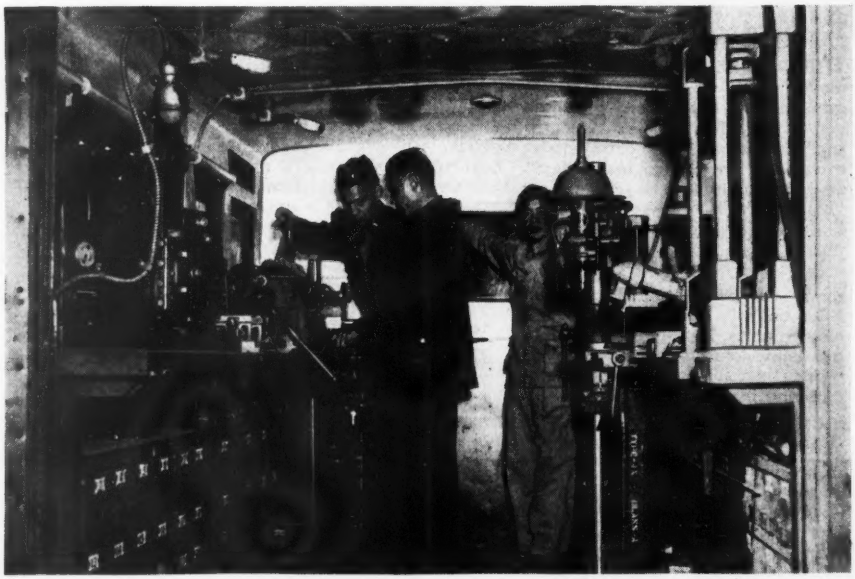
Portable Machine Shops Aid Chinese Forces

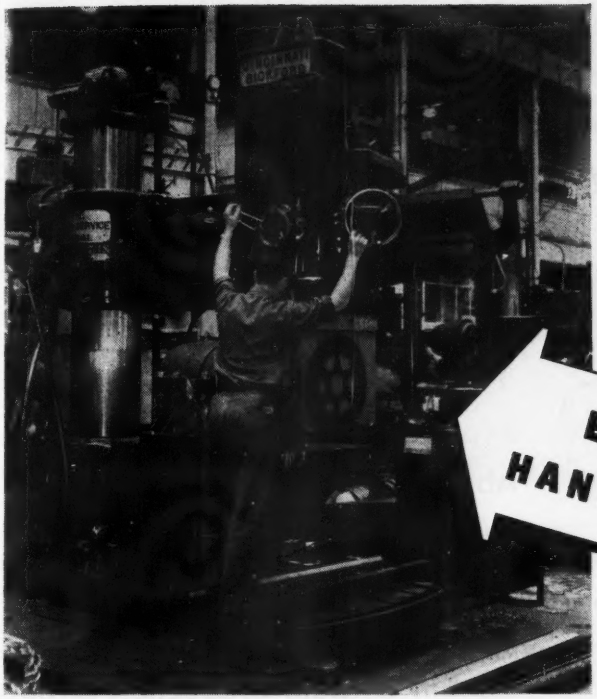
One of the latest contributions from America to the Chinese fighting forces consists of a number of GMC 2½-ton ordnance machine shop mobile trucks similar to that shown in the illustration.

The truck equipment includes a bench shaper, lathe, drill press, bench grinder, several portable electric drills, a pneumatic press, and a 5 KW generator set. A complete set of accessories is supplied for each machine, including a milling attachment for the lathe, and a complete stock of machinists' hand tools, gages and standard screws, bolts and fittings is also carried. The illustration shows Major Harold H. Morse of the American forces demonstrating the versatility of the lathe to Major General Siu Ho, Commanding General of Chinese Ordnance.

As fast as Chinese mechanics can be trained, the trucks will be operated by the Chinese under the supervision of American laision personnel.

(U.S. Army Signal Corps photo)

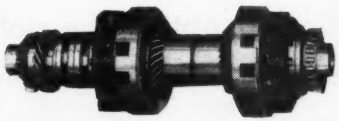






EASY HANDLING

Photo: Courtesy of Elliott Company, Ridgway, Pa.



The Cincinnati Bickford Multiple Disc Driving Clutch has unusually large gripping surfaces. Running at a constant speed it transmits a maximum power at all spindle speeds. Proper proportions and advanced design give a quiet, smooth and trouble-free drive.

Equal Efficiency of Every Unit Makes the Balanced Machine.

Easy handling pays dividends in time and profits. The Elliott Company speaks of the easy handling of their Super Service Radial Drill — its power and its freedom from trouble. Cincinnati Bickford installations are profitable installations the world over.

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See our condensed Catalog in Sweets Catalog Service.

ARMY-NAVY E

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THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.



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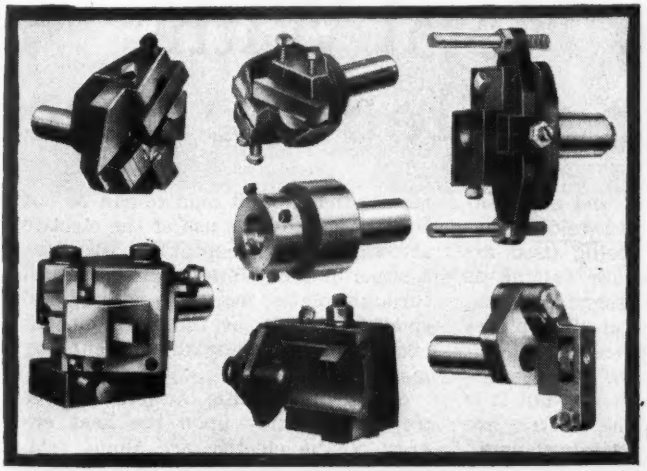
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These outstanding advantages result not only from long experience in the manufacture of screw machine tools but from experience in the daily use of thousands of tools as well. Operators find in them features of design and construction which simplify setups and permit maximum machine capacity. Catalog No. 34 listing complete line sent on request. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.



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BALANCE TURNING TOOLS
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BROWN & SHARPE



Have you ever cut rivet heads or pierced holes with your arc welder? The author tells how it is done.

By W. R. COFFIN

Cutting Metal With The Electric Arc

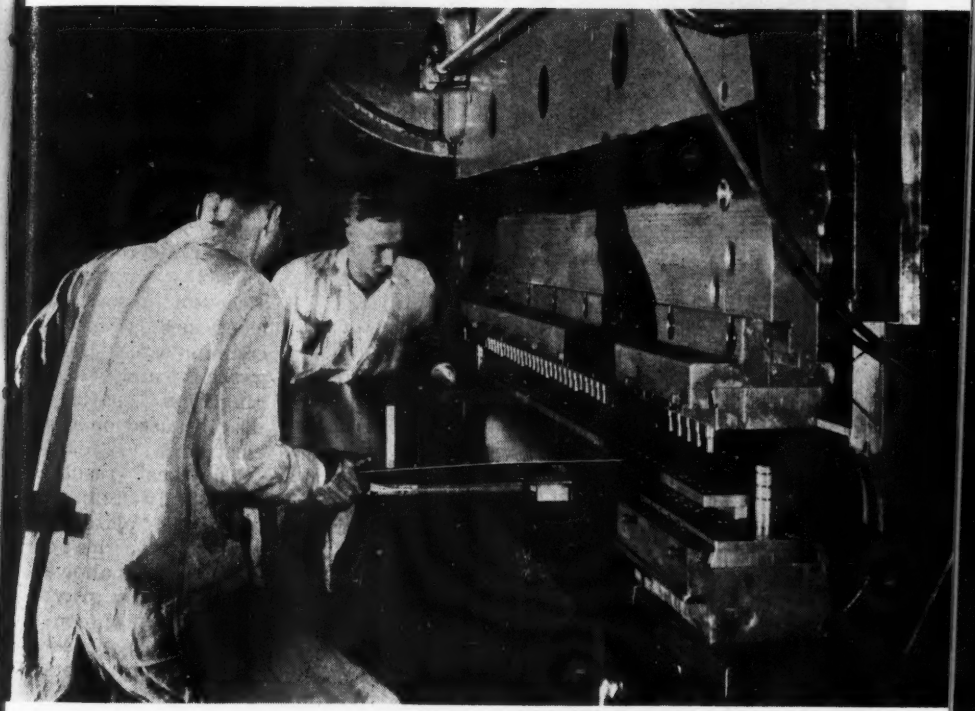
ASIDE from its first and most important task, the arc welding machine is increasingly being used for cutting plates to size, for cutting of heads of rivets in disassembling, and for cutting scrap metal into pieces that can easily be handled. The quality of the cut is not as good as the cut produced by gas cutting, but it is good enough so that the electric arc is often used in the cutting of scrap metal and for removing excess metal from castings.

Special alloys, cast iron, and metals that do not oxidize can be cut equally well by the use of the electric arc, and in this respect the arc does a superior job. Holes can be pierced through plates in any position, and rivet heads can be removed without necessity of defacing the surrounding metal surfaces.

Since the cutting action depends for its efficiency upon the heat energy of the electric arc alone, relatively high currents are used. Welding machines of the direct current type are usually used for this work,

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on a CINCINNATI PRESS BRAKE



Gang punching, as well as a great variety of forming, notching, combination notching and forming, trimming and punching . . . all are being done on Cincinnati Press Brakes.

Write for Catalog B-2, illustrating the possibilities of a Cincinnati Press Brake in your shop. Consult our Engineering Department on your punching and forming problems.

THE CINCINNATI SHAPER CO.

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Operator Holding Electrode in Position for Rivet Cutting. In this Case the Rivet has been Cut, as Indicated by the Molten Metal that has Run from the Rivet Hole

although alternating current welders are coming more and more into use for this purpose. In either case, the currents used range from 440 to 300 amperes.

Due to the high currents used, however, it is necessary to use special electrodes and to provide protection to the operator against the high heat generated by the arc. Carbon or graphite rods are usually employed, although coated electrodes are in common use. Both gaseous and slogging-type coatings may be used on the electrodes.

The best results are usually obtained when the plate to be cut is held in a vertical position, which allows the molten metal to flow off by gravity and thus keep the point of contact clear. However, if it is necessary to work with the plate in a horizontal position, an air blast can be

Produce with **SAFETY**

It pays to protect your operators by equipping your punch presses with

STRAND Enclosure Safguards

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SAFETY ENGINEERS

611 West Lake Street Chicago 6, Ill.



This Machine
LOOKS TO THE FUTURE

Illustration shows standard *American* V-1½-4 ton Vertical Hydraulic Press tooled for broaching four wrench slots simultaneously in a time fuse. The slide on which the fixture is mounted is interlocked with the machine controls. Rate of production is 200 parts per hour with fine finish. This is just one example of the many types of jobs performed by this versatile machine.



THIS standard *American* V-1½-4 ton Vertical Hydraulic Press greatly simplifies reconversion and makes possible worthwhile savings in equipment and re-tooling costs. It is capable of performing a large variety of work and is easily and economically changed over from one job to the next.

American engineers have developed several such versatile standard machines. One or more will undoubtedly fit into your present or future operations. When planning new production, be sure you get *American's* recommendation. There is no obligation. It is part of *American's* complete broaching service—machines, tools, and engineering. Write today for details.



To prevent misalignment and tool damage, use proper fitting pull heads with your broaching tools.

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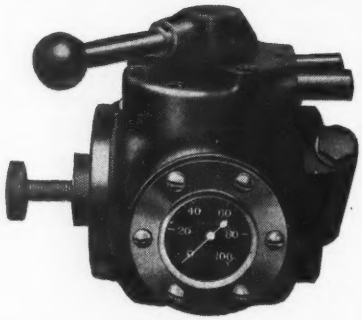
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BROACHING MACHINES
PRESSES
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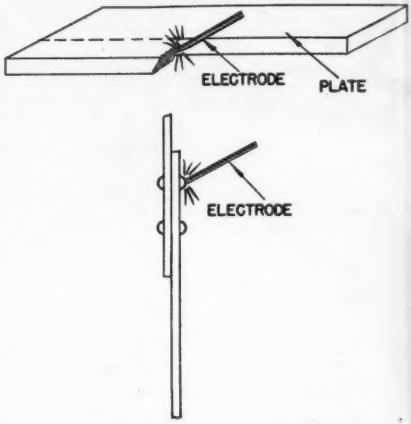


This convenient unit is adaptable for all air operated machines wherever air control is required. Pressure regulator, gauge, control valve, lubricator and strainer are combined in one efficient, time-saving mechanism.

MARTON EQUIPMENT, INC.

used to remove the molten metal at the top while gravity removes it from below. In cutting thick plates, the cut is begun at the bottom and maintained ahead of the top or upper surface so that the molten metal can flow away easily.

The electric arc is especially efficient for cutting the heads from rivets so that heavy pieces may be disassembled, due not only to the fact that the surrounding surface is left



Drawing Illustrating (above) Use of Electrode for Cutting Steel Plate, and (below) Method of Striking Arc on a Rivet Head to Melt the Head from the Rivet

practically undamaged, but also because the operation is performed quickly. To remove a rivet head an arc is struck on the top of the head and the operator moves his electrode with a rotary motion while the head is heating; thus the head is heated equally throughout and not simply melted at one point.

Coated rods are usually used for hole piercing. For this work an arc is struck and, since the metal deposits faster than the coating, the rod can be pushed into contact with the plate so that the coating will form a crater and hold the rod out

PATENTED **DUAL-SPIRAL** REAMERS

PRODUCE PRECISION HOLES

Three hi-speed steel blade segments are locked in place by an adjusting lock nut. Right-hand flutes on two segments spiral counter to left-hand flutes on the third blade segment, simultaneously. In this way a clean opposite-spiral shearing action is effected, and a satin-smooth surface is finish-reamed in any machinable metal or plastic. With its unusually large expansion range, this reamer will finish-ream holes of varying diameters which ordinarily would require 6 to 8 conventional expansion reamers.

WRITE FOR DETAILED DATA



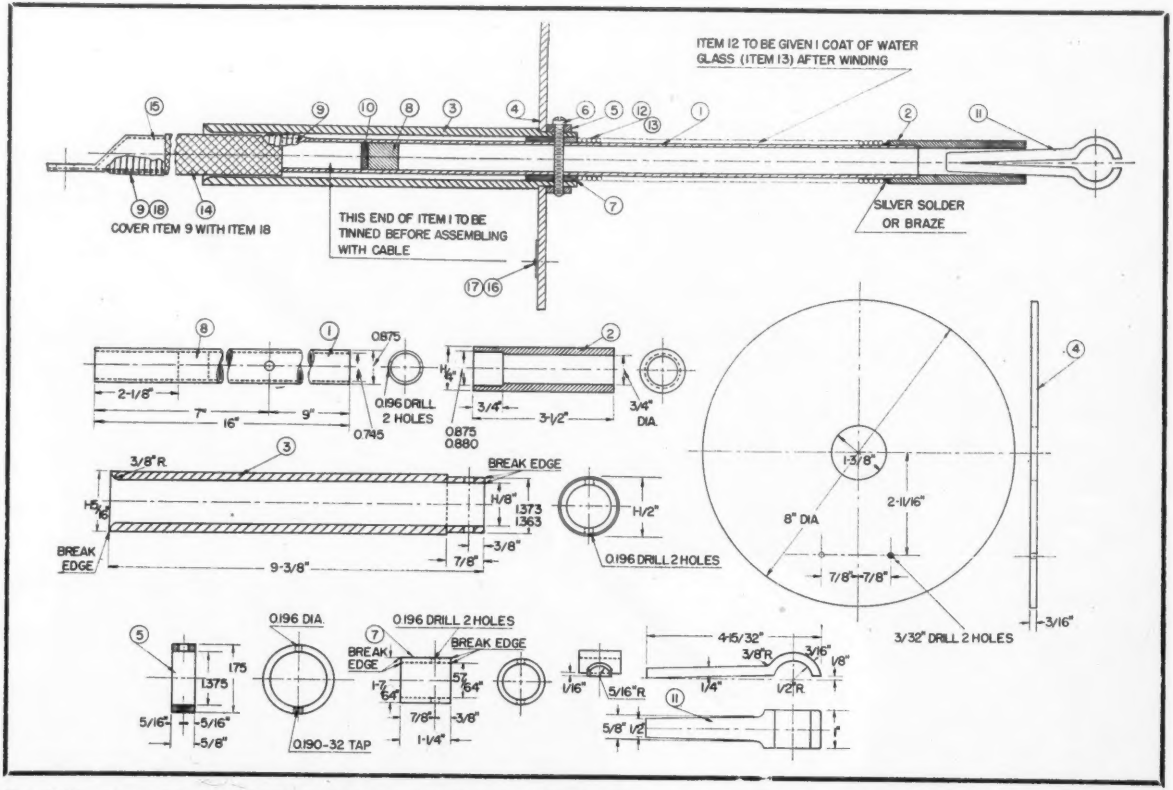
- ★ Eliminates Honing
- ★ Five Types Available
- ★ Requires Less Driving Power
- ★ Adjustable without Changing Set-up
- ★ Extensive Pilots for Alignment Jobs
- ★ Removable Blades Easily Resharpened
- ★ .033" to .080" Straight Line Expansion

LEMPCO

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far enough so that the arc is maintained. The crater prevents burning of the adjacent metal while the hole is being pierced.

The arc develops intense heat, consequently it is necessary to provide

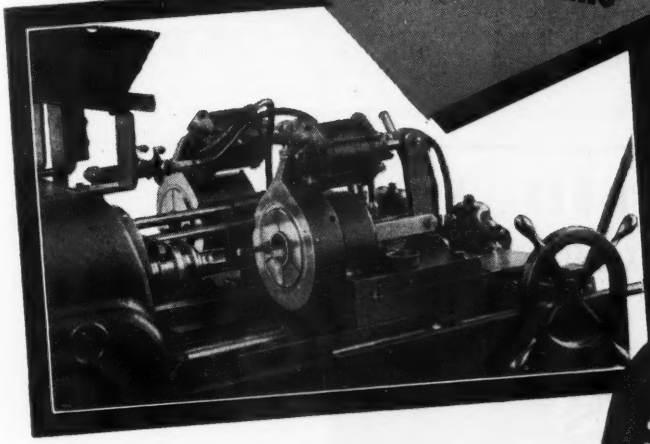


Detail Drawing of Carbon Holder; 500 Amp. 1—Tube. 2—Tube. 3—Handle. 4—Micarta Shield. 5—Set Collar. 6—Machine Screw. 7—Bushing. 8—Cork Plug. 9—Asbestos Tape. 10—High Melt Point Solder. 11—Forged Steel Jaw. 12—480 In. No. 17 Asb. C.C. Wire. 13—Water Glass. 14—Cable; 60 In. of 5.330 of 0.0063 No. 2913-6. 15—Terminal. 16—Name Plate. 17—3/32 x 1/4 Rd. Hd. Rivet. 18—Friction Tape.

KEEPING AHEAD OF THE TIMES

MURCHEY

Now Offers Special Applications for No. 22 DOUBLE SPINDLE Tapping Machine



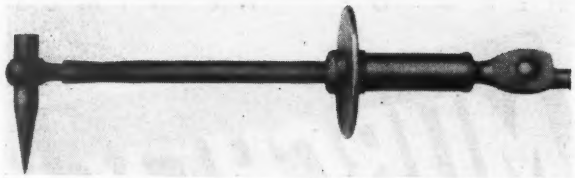
● Sizes and depths of threads for this particular application are as follows: Size 3" Straight Pipe Thread—Depth ⅜" in C. R. Steel W. D. 1010. Two hundred and fifty pieces per hour on two spindles. No. 22 Double Spindle Tapping Machine is capable of various other applications. Write us your requirements.

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Electrode Holder Equipped with Guard, Suitable for Carbon Arc Cutting

special holders and heat deflectors to protect the operator while the cutting operation is in process. A special adapter is used to hold carbon electrodes of the larger diameters—½ to ⅝ inch diameter—and a metal guard can be fitted to the standard electrode holder to protect the operator's hand from the heat.

The guard shown in the detail drawing is made from an 8-inch square of $\frac{3}{16}$-inch thick No. 213 Micarta, trimmed to form a disc, as shown. The drawing includes a nameplate, which is not, of course, essential to the operation of the holder.

On jobs where accuracy is an important factor, such as in production work, the gas cutting torch does a superior job, but for such operations as removing rivets, cutting small risers from castings, and many similar jobs the speed of the electric arc makes it more economical.

Sundstrand Oil Power Transmission for variable speeds between 10 and 2,400 r.p.m. is the subject of a four-page bulletin issued by the Pump Division of the Sundstrand Machine Tool Co., 2531 11th St., Rockford, Ill. The bulletin illustrates and describes the operating principles, features, and possible application of Sundstrand Oil Power Transmissions. Engineering data are also included in the bulletin, copy of which is available free by requesting Form No. 124.

MODEL No. 263-A

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3 K. V. A.

220 Volts

60 Cycle

Single Phase

Air Operated

Bench Type



Solenoid Air-Valve Foot-Switch Operated

Built-in Electronic Timer

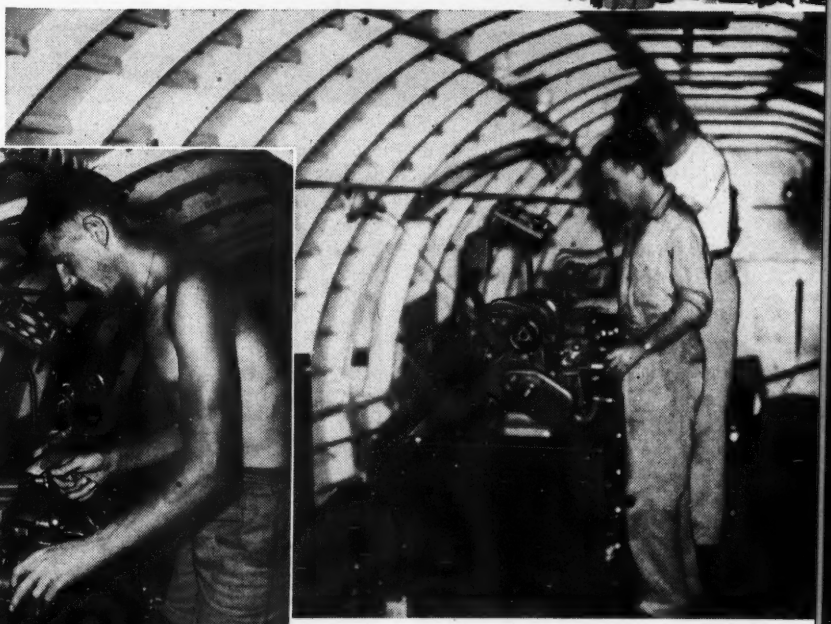
Adjustable Pressure Switch

For information and prices of spot, seam, flash and butt welders write

WELDEX INCORPORATED • 7326 McDonald Ave., Detroit 10, Mich.

FLYING MACHINE SHOPS BACK UP THE B-29'S





Interior views of a Commando Flying Machine Shop of the XX Bomber Command equipped with a South Bend Lathe. *Official U. S. Army Photos.*

Flying machine shops are playing a vital behind-the-scenes role in the operation of the B-29 "Superfortresses" now carrying on the air offensive against Japan.

With ordinary repair facilities, it takes days or even weeks to repair bombers grounded away from their bases—often they have to be abandoned. Now Curtiss Commandos fly machine shop facilities to these planes, enabling them to quickly return to their bombing missions. These flying machine shops, through the diversity of their metal working equipment, are performing every type of repair work except the complete rebuilding of engines and planes.

The unprecedented job being done by these flying machine shops is bolstering our striking power where it is needed the most. As an important part of this equipment, South Bend Lathes are contributing their dependability, accuracy, and versatility.

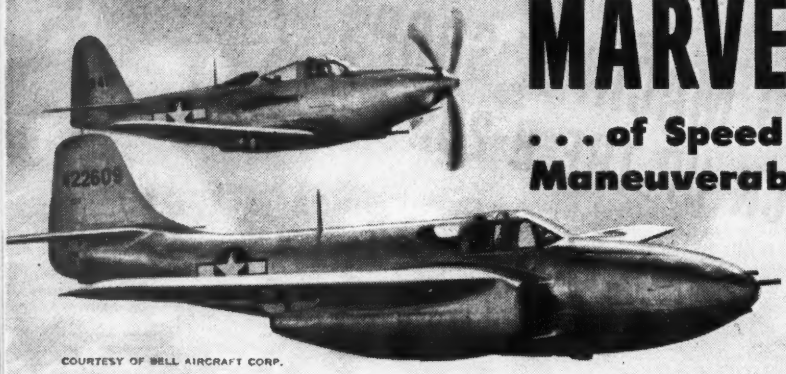
Write for new Catalog 100-D which illustrates all South Bend Lathes in full color.

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427 E. MADISON ST., SOUTH BEND 22, INDIANA • *LATHE BUILDERS FOR 38 YEARS*

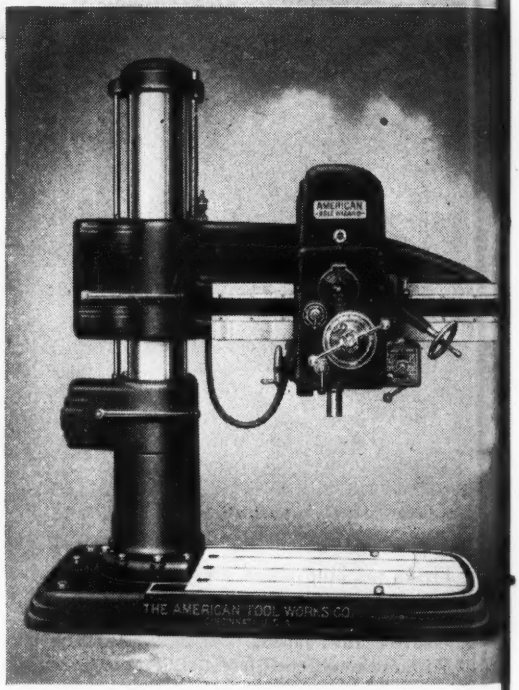
MARVELS

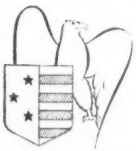
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Increasing numbers of planes in the skies over our far-flung battle fronts testify to the success which American aircraft manufacturers are achieving. Helping them with all kinds of drilling, boring, facing and reaming jobs "AMERICAN" Hole Wizard Radials are proving themselves outstanding performers on the super-accurate jobs which aircraft production demands. American manufacturing skill plus "AMERICAN" Hole Wizards are a winning combination for all types of war production. Bulletin No. 310 gives all the facts. It is yours for the asking.



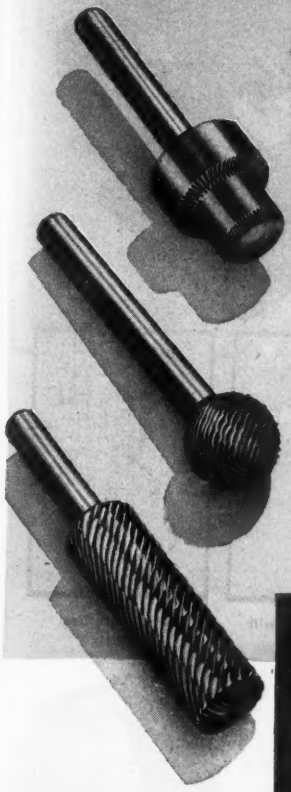


THE AMERICAN TOOL WORKS CO.

Cincinnati, Ohio, U. S. A.

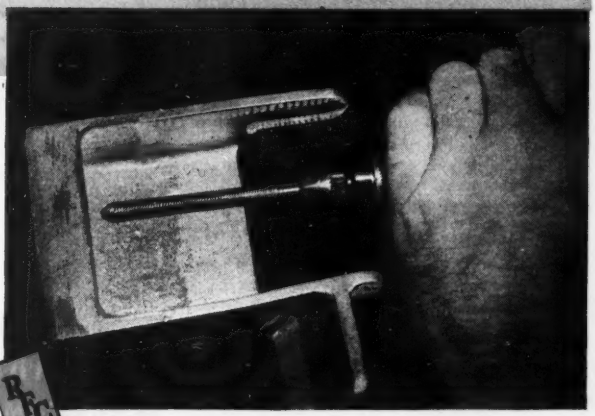
Lathes and Radial Drills

BORN WITH *Upper* AND *lower* SETS



Its lower set of teeth bite rapidly into a small casting. Then it uses the upper set to neatly chamfer the casting. This RFC HAND-CUT ROTARY FILE — illustrated at the left — is no more remarkable, however, than many of its brothers among the RFC special shapes.

The RFC is an interesting family of rotary files ... standard or special ... in high speed steel or high carbon steel. The hundreds of plants that have adopted them class them among the "best little workers in the factory." They come in all shapes and sizes. Unsurpassed for precision and speed—even in hands not the most skilled.



• If hand-filing is slowing up some of your work, you likely have a problem that an RFC file would enjoy getting its teeth into. May we discuss it with you? Or, write for the new RFC catalog.



The **ROTARY FILE COMPANY**
STRATFORD, CONN.

"DON'T SEND A MAN TO DO A BOY'S JOB"

Use the Small

Waltham

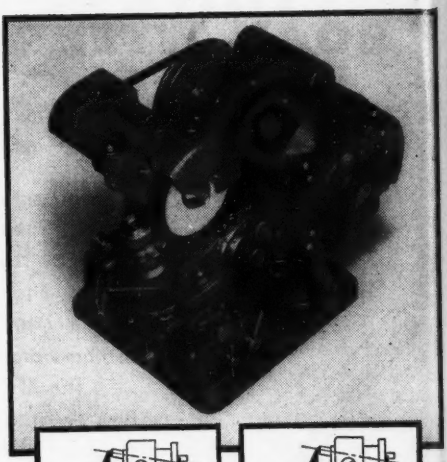
CUTTER SHARPENER

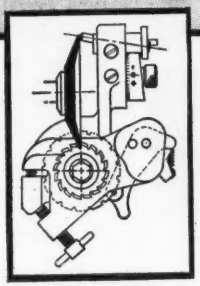
TO SHARPEN SMALL CUTTERS FASTER *and more* ACCURATELY

By keeping cutters sharp on a Waltham Cutter Sharpener, your production machinery can be kept at peak efficiency. Sharp cutters produce more work, more accurately—sharp cutters make any machine perform better. The Waltham is a bench tool—it is fast and accurate even when operated by unskilled help—it is *especially designed* for sharpening gear and thread milling cutters, straight fluted hobs and multiple cutters that are not much over 2 inches in diameter and 3/8 inches thick.

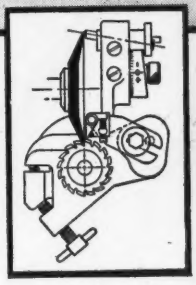
The Waltham is regularly furnished with precision index plates (left line drawing), and may be equipped with a pawl device for locating on the top or back of the teeth (right line drawing).

No machine is better than the cutting edge of the tool it uses.





Construction with Index Plate



Pawl Locating Device

Mail the coupon for your copy of the Waltham Folder.



Please send me Bulletin No. 344 which gives full details on the Waltham Cutter Sharpener.

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Increases tool life by 25%...improves finishes

Turning . . . threading . . . tapping tough carbon steel, stainless steel and monel metal faster, better and at lower costs. That's the record of a large Pennsylvania shop when it switched to Sunicut.

Increased tool life and better finishes was the aim of the production manager. With Sunicut, he was able to obtain a saving of 25% in tool life, improve finishes on every operation and at the same time eliminated the necessity of various grades of cutting oils.

Outstanding transparency, high heat absorbing and excellent metal wetting qualities of Sunicut make possible longer tool life, finer finishes and increased operator interest. This clear, transparent, sulphurized cutting lubricant has proved its production value in the leading metal working plants of America.

In your plant let Sunicut help you increase the life of cutting tools, improve finishes, and step up production. If you are faced with a metal working problem, remember there's always a Sun Cutting Oil Engineer ready to help you . . . just write

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SUN INDUSTRIAL PRODUCTS

OILS FOR AMERICAN INDUSTRY

Improved Machining Characteristics of Leaded Steels

The following article is a brief review of the characteristics of the leaded steels that have been available in Britain in recent years. The improved machining characteristics of the steels, as compared with non-leaded steels, have led to claims of marked increases in the rate of output of many different products. The article is based on information provided by a manufacturer of these steels; the production data was supplied by some well-known firms who are now using the steels.

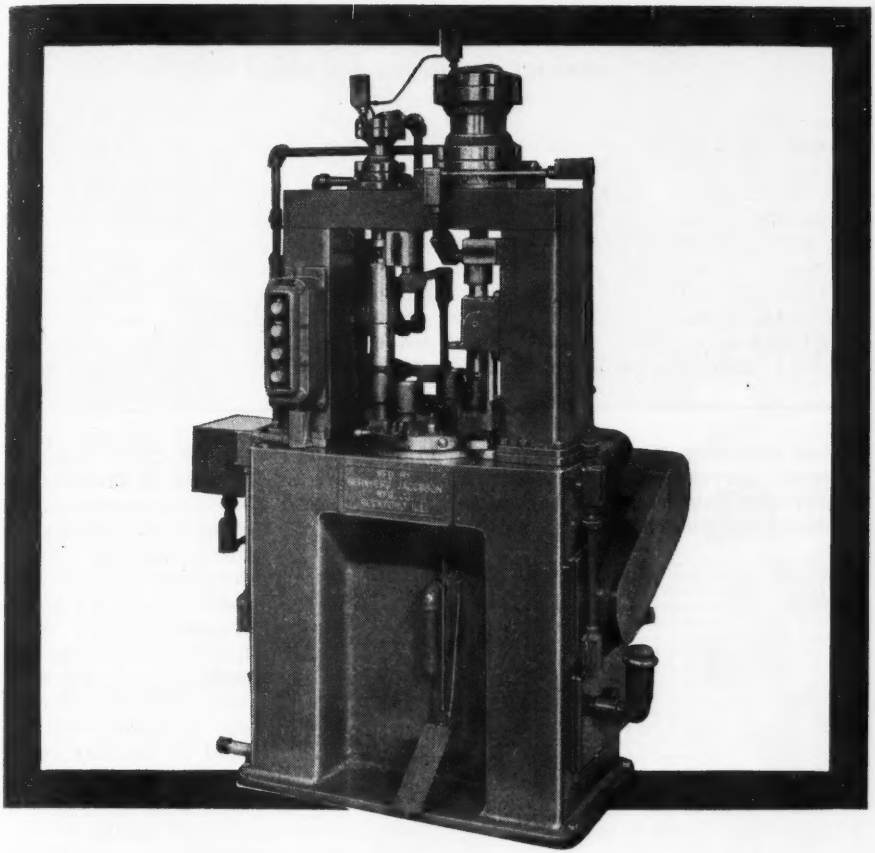
(Courtesy British Information Services of the British Government.)

THE greater ease in machining some of the materials now available for the manufacture of metal products is probably the least widely recognized of the many factors which has led to marked improvements in machine shop efficiency in recent years. One of the more outstanding developments in this field has been the introduction and production, in Britain, of leaded steels.

Leaded steels, as their name implies, contain a small quantity of lead; usually 0.15 to 0.30 per cent. The lead is added by a special method which can be applied to all grades of steel produced by the casting process without, it is claimed, altering their usual mechanical properties or their response to heat treatment to any appreciable extent. Some actual test figures in support of these claims are presented in Table I.

The machinability of the steel, as a result of the addition of lead, is considerably improved. Less energy is absorbed in the cut; the temperature of the machined chip, and therefore of the tool, is lower, and there is a general tendency for leaded steels to form shorter chips—which is, of course, a substantial advantage in many instances.

An empirical mathematical expression has been deduced from data obtained by experimental machining tests, which it is now generally agreed correlate with a fair degree of accuracy the cutting speed, feed, tool life and other factors involved in turning operations under normal machine shop conditions. This expression indicates that an increase in cutting speed of 25 per cent reduces tool life to 1/10. The effect on tool life of increasing feed is not so marked. Thus, 25 per cent increase in the feed will only reduce tool life to a quarter.



Fast assembly with hydraulic power . . .

This example of special machinery developed to simplify assembly operations makes full use of hydraulic power by means of Hannifin Standard Cylinders. This machine, designed by Rehnberg-Jacobsen of Rockford, is one of three used in a munitions production line. A threaded member is screwed down tightly into a housing; two parts are staked together to hold against vibration. Three of these machines provide work capacity previously requiring 14 operators using hand tools.

Hannifin hydraulic cylinders provide smooth, easily controlled power for these operations. Precision cylinder construction, with bored and honed cylinder bodies, means maximum use of hydraulic power, plus long dependable working life. Hannifin hydraulic cylinders with no-tie-rod design mean easy application and simplest piping. Write for Bulletin 35 with complete data on hydraulic cylinders. Hannifin Manufacturing Company, 621-631 South Kolmar Avenue, Chicago 24, Illinois.

HANNIFIN · CHICAGO · USA

Hannifin
HYDRAULIC CYLINDERS

TABLE I. Mechanical Test Data

Quality	Condition	Analysis C.	Mn.	S.	P.	Ni.	Cr.	Pb.	Mechanical Tests T.S.	E.	R.A.	Izod
Free-cutting ¼ in. dia.	Drawn	.13	.95	.235	.051	—	—	—	36.8	24.1	49.0	—
Leaded ¼ in. dia.	Drawn	.12	.98	.226	.067	—	—	.20	37.0	23.0	50.1	—
3. S. 1⅝ in. dia.	Drawn	.16	.74	.042	.05	—	—	—	43.3	18.1	54.1	—
Leaded 1⅝ in. dia.	Drawn	.17	.69	.033	.027	—	—	.22	44.9	16.3	58.0	—
40% C. 1⅞ in. a/f. hex.	Norm.	.40	.61	.035	.028	—	—	—	36.7	26.0	43.4	24/25
Leaded 1⅞ in. a/f. hex.	Norm.	.42	.61	.034	.033	—	—	.20	39.0	25.0	41.0	25/27
Ni/Cr. 1¼ in. dia.	Heat	.41	.74	.028	.013	1.73	.65	—	67.5	18.0	56.5	55/60
Leaded 1¼ in. dia.	treated	.42	.25	.022	.012	1.74	.65	.17	63.5	18.0	53.0	52/57
2.S.2 1 in. dia.	Heat	.37	1.45	.008	.02	.28	MO.	—	62.0	22.7	60.7	57/59
Leaded 1 in. dia.	treated	.37	1.45	.008	.02	.28	MO.	.17	60.1	23.6	60.7	55/57

Tool efficiency (i.e., production efficiency) curves evaluated from the empirical formula referred to are reproduced in the chart Fig. 1. The curves clearly show that heavier feeds, producing chips in thicknesses greater than 0.003 inch, are far more efficient than lighter feeds which produce thinner chips. Moreover, the use of a material having a higher machinability constant leads to increased production in the machine shop by permitting a higher cutting speed or heavier feed, or a combination of both.

Comparative machinability constants for leaded steels and their non-leaded counterparts are given in Table II. The figures in the third column show that the machinability

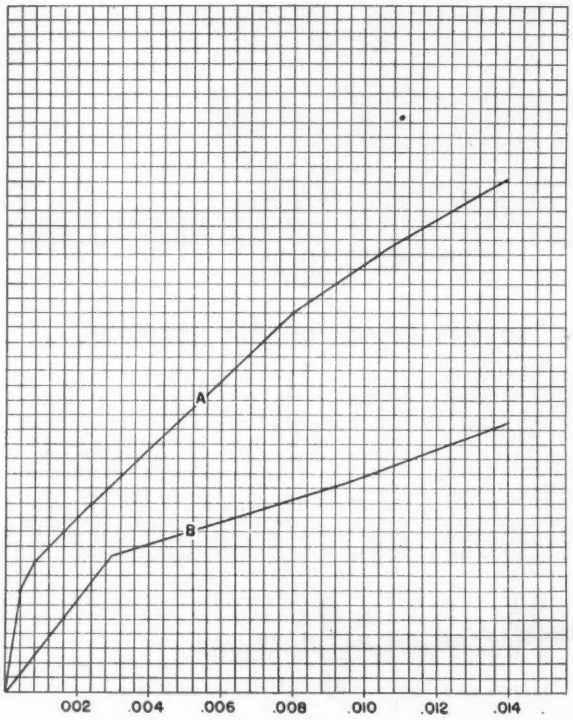


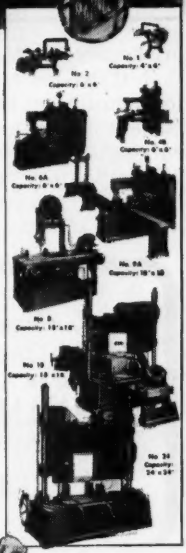
Fig. 1—Chart of Function of Tool Efficiency; i.e., Volume of Chips per Minute. These curves are based on an Empirical Formula Deduced from Data Obtained in Machining Tests. A—Depth of Cut, ⅛ Inch. B—Depth of Cut, 1/16 Inch



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With their modern high speed MARVEL Hack Saws the Crucible Steel Company's Warehouses can deliver orders "from stock," whether for a few miscellaneous lengths, a thousand alloy steel gear blanks, a single tool steel disc 18 inches in diameter, or other lengths or slices accurately cut-off from any type bar stock.

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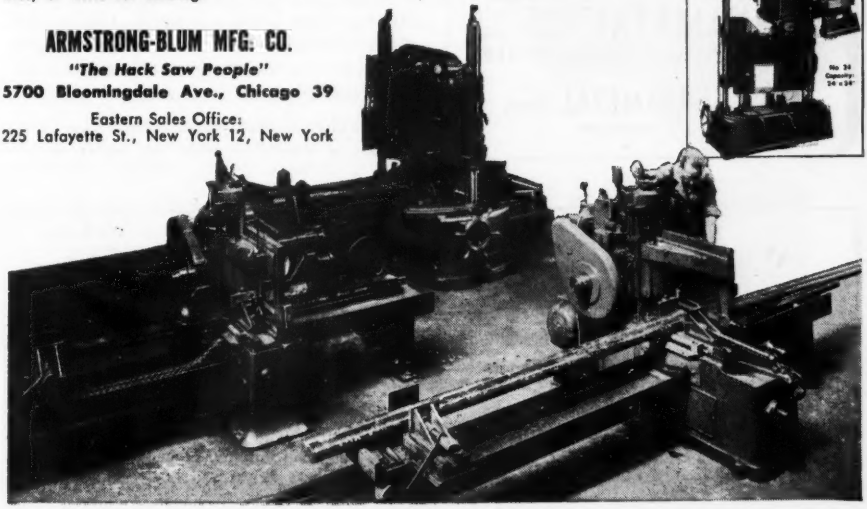


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constants for the leaded steels are greater by 24 to 35 per cent. From the mathematical expression, or formula, previously referred to, this means that if leaded steel were substituted for non-leaded steel otherwise of the same composition and condition, the cutting speed could be increased by 24 to 35 per cent without altering the other machining conditions. As already stated, however, it is often better to increase feed rather than speed. If this were done, the leaded steels would allow increases in the feed ranging from 36 to 60 per cent.

TABLE II.

Comparative Machinability Constants (approx.)

Type of Steel	Leaded	Non-Leaded	Improvement Per Cent
Free cutting	15.5	12.5	24
Semi-Free Cutting	11.2	9	24
0.30 Carbon	9	7	28
0.40 Carbon	8	6.2	29
55/65-Ton Tensile Alloy (Heat-Treated)	6.4	4.75	35

Alternatively, of course, leaded steel might be machined without any alteration in the machining conditions, and from the general formula an increased tool life of from 850 to 2,000 per cent would be expected. The theoretical tool life increase quoted appears to be phenomenal, but it has been substantiated in practice. In one instance, when thread milling heat treated alloy steel, the tool life was increased—it is claimed—by 1,400 per cent on changing to the lead alloy.

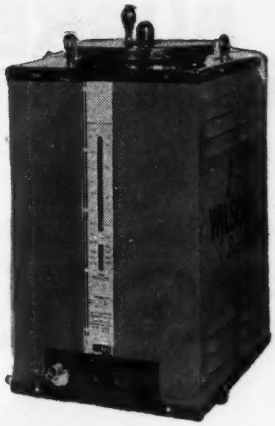
This method of using leaded steel only increases production to the extent that time is saved through the less frequent need to regrind the tools. For example, if the tools for a normal set-up were reground once during each ten-hour shift, the leaded steel would allow the machine to run at least ten working shifts before regrinding became necessary.

On the assumption that the machine is idle for half an hour while





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the tool is being reground, the saving would be equal to nine regrinds of the tool, with a consequent gain of 4½ hours' production in 100 working hours. The net increase in production is thus 4.75 per cent. While the use of leaded steel would, therefore, make possible greatly increased economy in tools, it would be preferable from the production standpoint to increase either the speed or feed, where practicable.

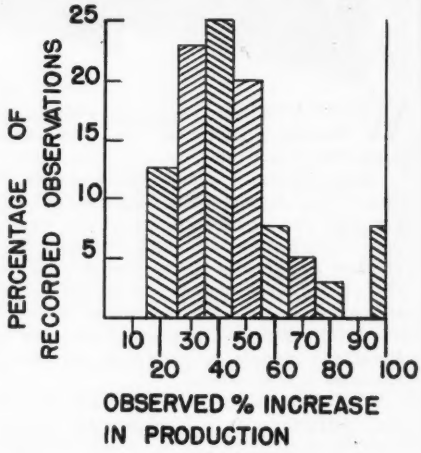


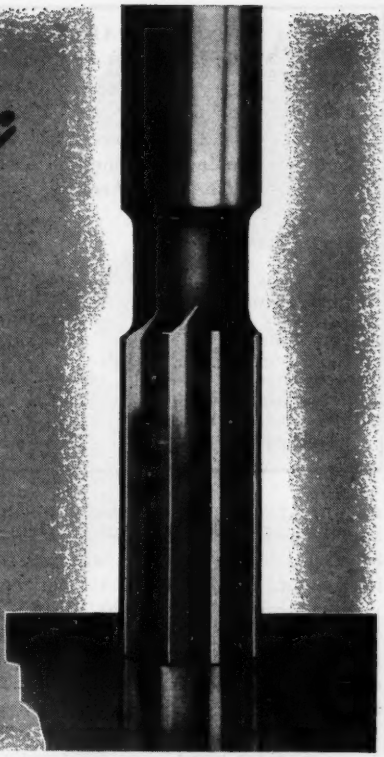
Fig. 2—Frequency Chart from Recorded Machine Shop Data, Showing Output Increases Averaging 40 Per Cent. Number of Observations, 50. Mean, 40 Per Cent (Excluding these Values).

Based on the empirical formula, therefore, the conclusion is that the use of leaded steels can lead to increased production, at the machine, which may vary from 24 to 60 per cent. This does not take into account, however, the improved machine efficiency which, it is claimed, has proved of value in practice by contributing to total production increases in excess of 60 per cent.

Many machine shop reports of increased production through the use of leaded steels have been received, and

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TABLE III.

Production Data for Small Calibre Shell

Material: 1⅝-inch diameter cold drawn bar

C.	Mn.	S.	P.	Si.	Pb.
0.35/0.42	0.9/1.2	0.06 max.	0.06 max.	0.1/0.25	0.15/0.25

Machines: 6 spindle 1⅝-inch automatic lathes

Tool Steel: 18.4.1 H.S. steel. Coolant: Cutting oil

	Leaded	Non-Leaded
Spindle speed—r.p.m.	276	228
Feeds:		
Form tools, drills, etc.	0.0051	0.0045
Finish form tools	0.00057	0.0005
Reamers	0.0131	0.0115
Cycle time	1 min. 45 secs.	2 min. 26 secs.
*Tools reground or changed	3	177
Machine hours worked	60	160
Shells produced	1,190	1,519
Shells per machine hour	19.5	9.5

* Treating each tool in the set-up as an individual.

an analysis of 50 of these reports is reproduced in the chart Fig. 2. It will be observed that the average increase in production is about 40 per cent, with a range of from 20 to 100 per cent. This chart tends to substantiate the anticipated increase in production deduced from the empirical formula.

The results charted are further supported by the following details of actual machine shop experience with leaded steels in the works of a number of well-known firms.

Machining Leaded Steels in an Automobile

An important firm whose works in peace time were engaged primarily in the manufacture of accessories and equipment for motor vehicles recently conducted a large scale, detailed test of a cold drawn leaded medium - carbon steel used in the production of a small calibre shell body. Table III gives a summary of the report, and the set-up on the 6-spindle automatic. On changing to leaded steel, the spindle speed, and therefore the cutting speed, were increased by 21 per cent, and the feeds for all tools were stepped up by 14 per cent. This resulted in a net increase in rate of production at the machine of 39 per cent.

In addition, notwithstanding the increased speed and feed, there was a further important gain as a result of the longer tool life. Due to the consequent improvement in machine efficiency, the actual output of shell bodies per machine hour was 19.5 for the leaded steel as compared with 9.5 when using the non-leaded steel. This

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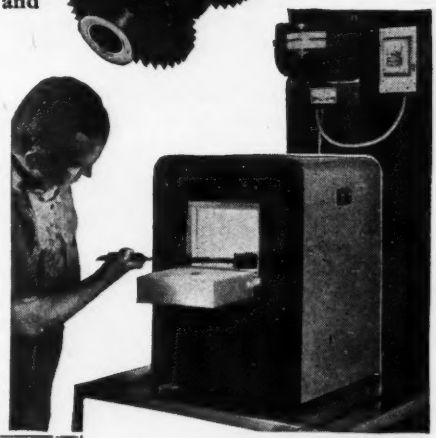
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TABLE IV.

Production Data for D-Section Clinch Nut

Material: $\frac{5}{16}$-inch dia., D-section, Free Cutting Steel.
Machine: 4-Spindle Automatic. Coolant: Soluble Oil.

	Leaded	Non-Leaded
Spindle Speed (R.P.M.)	1,600	1,050
Feeds	No change	———
Parts per Hour	360	240
Tool Life	8 hours	8 hours

was equivalent to an increase in output of just over 100 per cent.

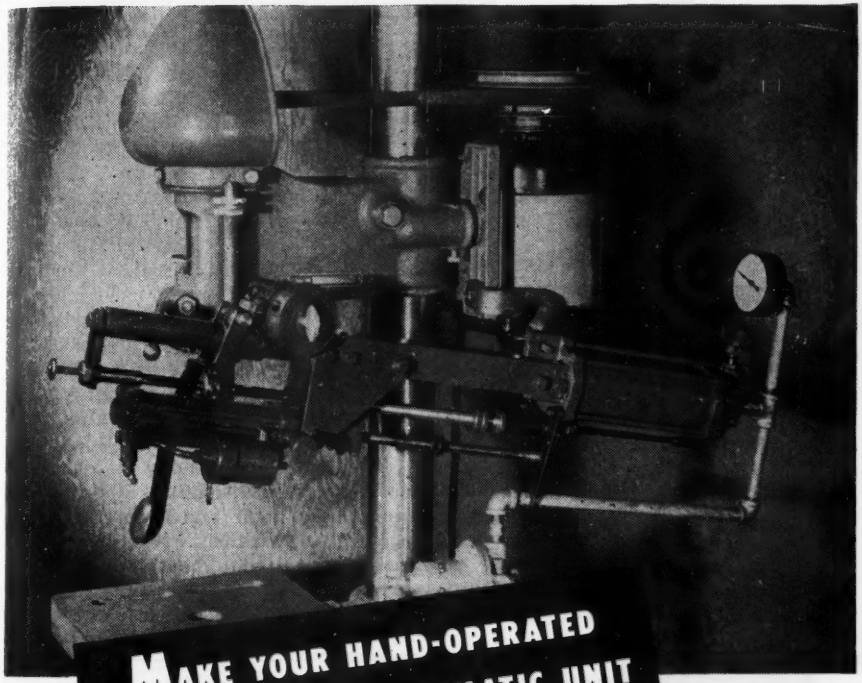
Another large firm has had considerable experience in producing a D-section clinch nut in both ordinary and leaded free-cutting steel; the data quoted in Table IV is based on their experience. The increase in output of 50 per cent was due, in the main, to the higher cutting speed made possible by the use of the leaded steel.

The same firm also reports that in the manufacture, from the leaded free-cutting steel, of plain $\frac{5}{16}$-inch hexagon nut blanks, chamfered on one side, they obtain 1,224 nuts per hour on a special automatic under these conditions: Cutting speed, 215 feet per minute; parting-off feed, 0.0016 inch per revolution; forming feed, 0.0017 inch per rev.; drill feed, 0.004 per inch per rev.; and tool life between grinds, 3 hours.

They further state that when they attempted to run under these conditions with non-leaded steel, the results were so poor that it was necessary to reduce, substantially, the cutting speeds and feeds.

By making possible an increase in the feed, the change-over to leaded steels is claimed by one firm to have





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TABLE V.
Production Data for Patented Stud

Material: $\frac{7}{16}$-inch dia. leaded free cutting steel.
Machine: Capstan lathe. Coolant: Soluble oil.

	Leaded	Non-Leaded
Spindle speed (r.p.m.)	1,980	1,980
Feed (Turning)	0.007 in.	0.0045 in.
Hand (Forming)	0.003 in.	0.002 in.
Average hourly output	150	100
Tool life	6 hours	3 hours

resulted in an increase of 50 per cent in the production of a patent stud on a hand-operated capstan lathe. Moreover, it is claimed that the tools have lasted twice as long between grinds; so, for the same tool life, the cutting speed might have been increased by about 6 to 7 per cent with a correspondingly greater output. The data for this job is given in Table V.

Reports so far discussed have dealt with leaded steels of the carbon and free-cutting types, but the improved machining characteristics claimed for other grades are equally marked. Here is an example of increased production efficiency through the use of a leaded alloy steel in the works of a well-known spark plug manufacturer. It concerns the machining of a spark plug body from a heat-treated manganese molybdenum steel conforming to specification 2.S.2.

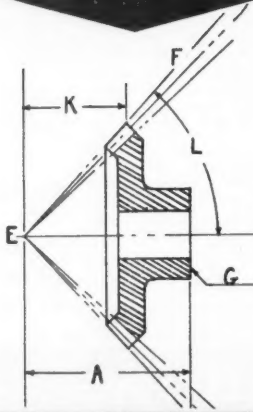
The spark plug body is produced on 5-spindle automatics using high speed steel tools and a cutting oil as coolant. Previously, this component was made from heat-treated alloy steel 4.S.11, giving the same mechanical properties as 2.S.2. Details of

Here's the Problem

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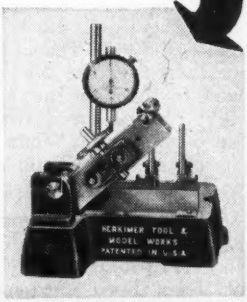
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TABLE VI.

Production of Sparking Plug Body

Material: Heat-treated manganese-molybdenum steel.

C.	Mn.	S.
0.32/0.37	1.4/1.6	0.05 max.
P.	**Si.**	**Pb.**	**Mo.**
0.05 max.	0.25	0.15/0.25	0.25/0.35

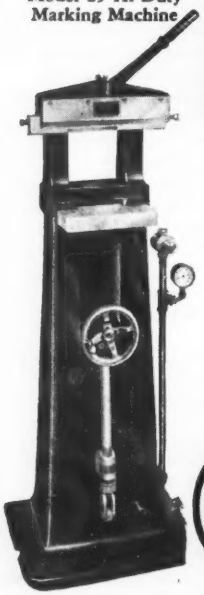
Operation	Nominal Increased Rate of Output
Automatic lathe	31 to 33½% Improved machine efficiency will give a value higher than this for actual machine output.
Facing on drilling machine	100% by eliminating an intermediate facing operation.
Tapping	17½%
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this job are given in Table VI.

The life of circular form tools was increased by 250 per cent (3½ times as long); there was an observed reduction of 25 per cent in scrap due to the better finish and so on; and there was a saving of 12 per cent in consumption of cutting oil due to the more conveniently compact form of swarf giving less scatter and better recovery. The greater rate of output is due to a combination of a small increase of speed and a somewhat larger increase in feed.

The short curly swarf (chips) which appears to be characteristic of lead bearing steel is a great advantage, particularly in automatic lathe

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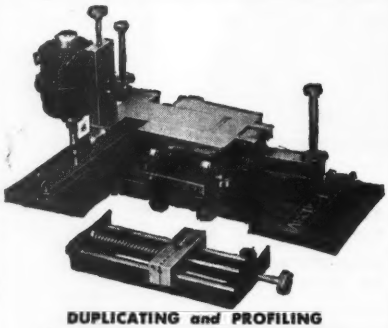
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- Shell Reamers
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Color Code for Lubricants

Unskilled labor can effectively be guided in applying the correct grease or oil to machinery through the use of a new American War Standard based on a simple system of colors, according to an announcement by the American Standards Association. The standard was developed at the request of the National Machine Tool Builders' Association and the War Production Board.

The purpose is to facilitate the correct lubrication of machinery and at the same time to effectively reduce the amount of damage to machinery in war plants from misuse of lubricants by unskilled labor. According to the National Machine Tool Builders Association, machinery damaged through ignorance as to the proper application of lubricants has led to serious impairment of war production, not only because machines thus damaged are out of production for a time but also because materials for repair are often difficult to obtain.

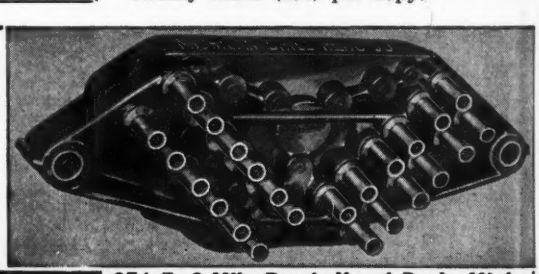
The Color Code for Lubrication of Machinery aims to make the application of the correct lubricant so simple that the least skilled employee can hardly make a mistake. The committee in charge has worked out a system for color markings to be applied to the lubricant containers and also to the points where the lubricants should be applied. The lubricating device, such as an oil can or grease gun, and the lubrication fitting to be served with it are marked with the same color, either by paint or decalcomania. Thus the servicer has only to "match colors" to be sure that each lubricant is used in the correct place.

Copies of the American War Standard Color Code for Lubrication of Machinery—Z47. 1-1945—may be obtained from the American Standards Association, 70 East 45th St., New York 17, N. Y., at twenty cents (20c) per copy.

Pictured: a 24-Spindle Heavy-Duty Drill Head.

DESIGNERS AND MANUFACTURERS OF MULTIPLE DRILLING EQUIPMENT.

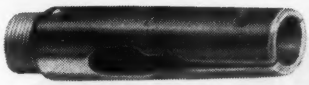
We invite your inquiry.

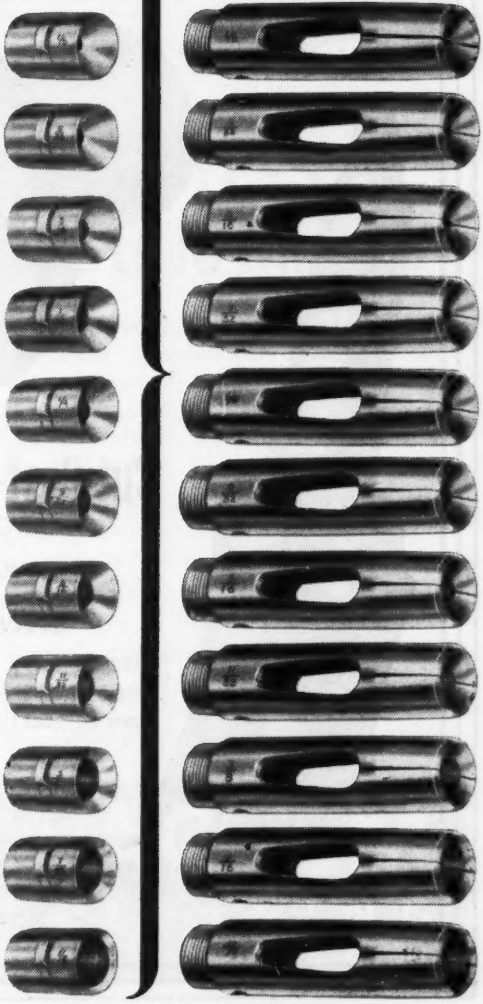


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ONLY 1 HARDINGE

Style "B" Master Feed Finger with interchangeable pads saves ALL this





THE illustrations graphically show the material saved when a HARDINGE Style "B" Master Feed Finger and interchangeable Pads are used instead of conventional solid feed fingers. Although this saving has been going on in screw machine departments using Style "B" since 1928, it is now more important than ever before as the economy not only saves money for you, but also conserves steel which is of vital importance today.

This saving is apparent to you. The many other advantages of using HARDINGE Style "B" Master Feed Fingers with either steel, bronze or nickel cast iron pads will be immediately appreciated when you put them into use. Learn these advantages by asking for your copy of the bulletin illustrated below.

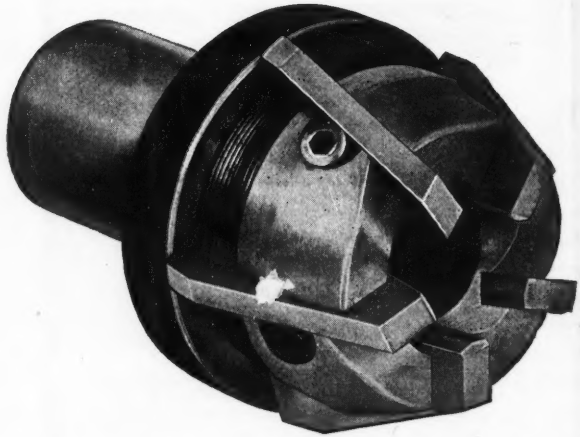
HARDINGE BROTHERS, Inc.
ELMIRA, N. Y.

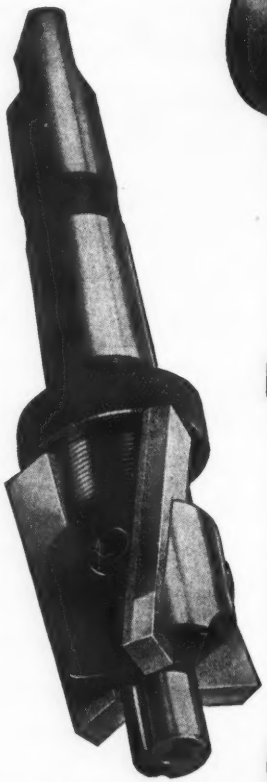


Ask for this bulletin

Every screw machine department should have the complete information given in this bulletin. Available to purchasing agents, superintendents, foremen, engineers, set-up men and operators in organizations which have a screw machine department.

GENESEE ADJUSTABLE HOLLOW MILLS





Style H Facing and Counterboring Tool

Cut Cost—Increase Production

with GENESEE inserted blade—

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FACING and COUNTERBORING TOOLS
SPECIAL PRODUCTION TOOLS

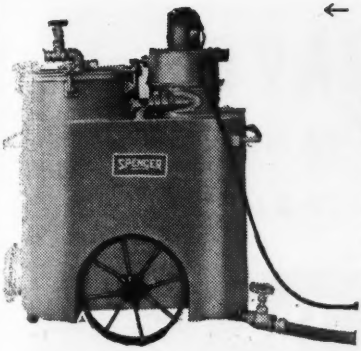
Backed by 35 years experience our Engineering Department is always ready to serve you in your Production Tool problems.

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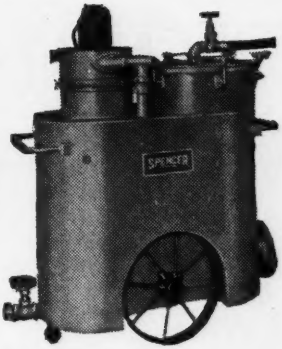
GENESEE MFG. CO.

ROCHESTER 4, NEW YORK



← **Pick-up position:** Suction hose on intake at swivel connection—Two way valve open—slide valve in—three way valve open to atmosphere.

Discharge position: Pressure in tank—hose on drain valve—two way valve closed—slide valve out closing intake to vacuum producer and opening ports to allow air to be drawn into vacuum producer from outside—three way valve closed delivering air into tank under pressure.



The Spencer SUMP-VAC Cleans Sumps in 2 to 10 Minutes

A Spencer vacuum producer mounted on a closed tank on wheels removes all liquid and sludge from sump tanks in two to ten minutes compared with half an hour with former methods. The rate of pick up is 40 gallons of liquid per minute.

The tank capacity is 125 gallons or enough for 3 to 5 average sumps. A filter basket collects chips and heavy sludge. A Neoprene float valve prevents overfilling of the machine. It is emptied by gravity in two minutes. By turning the valves provided with the machine and connecting the hose to the drain valve, liquid can be discharged under approximately 3 lbs. pressure. This permits raising the liquid to a height of 6 ft., emptying the tank into a drum or other container for easy disposal.

No priming is necessary—and all material in the sump tank is cleaned out by air vacuum after the liquid is removed.

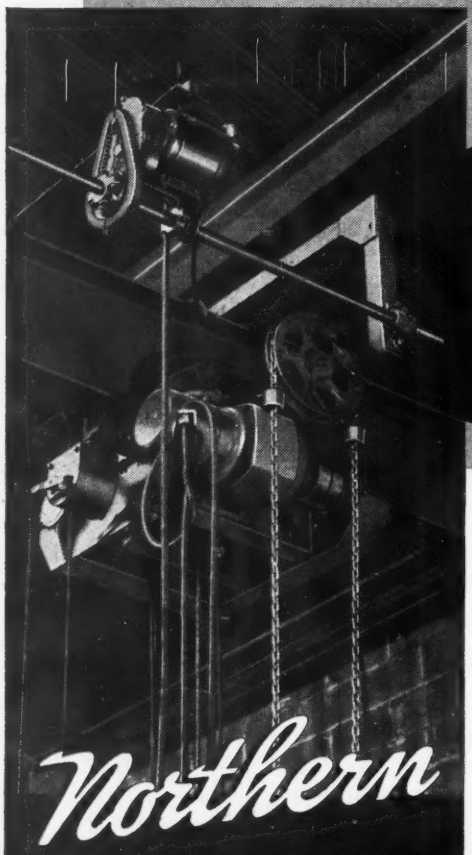
Sizes ¾ or 1½ horsepower, universal or single phase motors, 25 to 60 cycles, 110 or 220 volts or d.c.; 12½ foot vacuum hose lengths and 50 foot cable extension. Ask for the bulletin.

SPENCER VACUUM CLEANING

THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.

288A

MOTOR TRAVEL FOR HAND TRAVELED CRANE BRIDGES



The Northern "Travelator"

Northern

ENGINEERING WORKS

2615 Atwater Street, Detroit, Michigan
Offices in Principal Cities

Northern Crane & Hoist Works Limited,
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Less than half a day required for application—no dismantling of crane—any good mechanic can apply the Northern "Travelator."

It provides pendant push button controlled electric power travel for hand traveled bridges within the range of 10 tons capacity.

The "Travelator" is an inexpensive, thoroughly effective durable device.

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TALIDE-TIPPED for *Extra* Production!

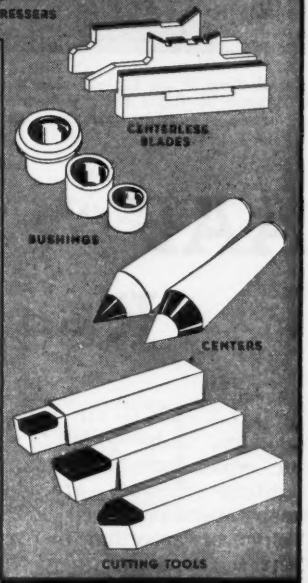


TALIDE METAL . . . is a superior grade of Tungsten Carbide—developed by us during the past fourteen years and manufactured today by our exclusive Hot Press Method. It has exceptional density, strength and hardness and is ideal for application at wear points on tools, machinery and equipment. Our special process makes it possible to produce Talide Metal wear strips in any length, die nibs and bushings with hole sizes up to 24", and tool tips with extra hardness and toughness.

War plants all over the country are using super-hard Talide Metal to increase the output of all types of ordnance material processed on lathes, grinders, draw benches, presses and other metal-working equipment.

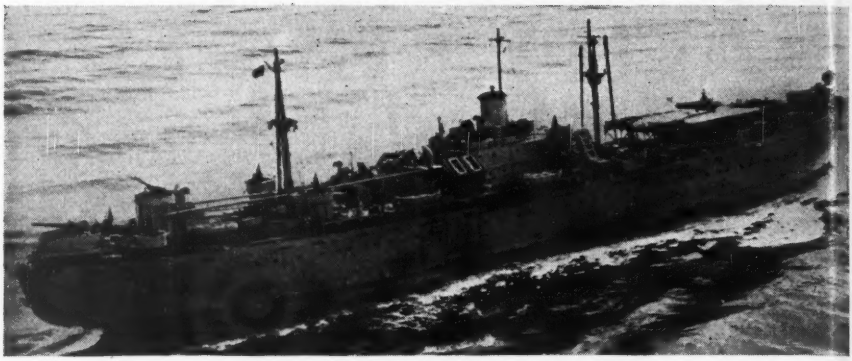
When peace comes, the extra advantages that Talide Metal offers of LONGER LIFE, BETTER FINISH, CLOSER TOLERANCE and MORE CONTINUOUS MACHINE OPERATION will make it possible to produce greater quantities of lower cost peace-time goods.

Our experienced organization will gladly recommend where Talide Metal can profitably increase your production. Your inquiry will receive our prompt attention.



TIPPED WITH TALIDE TUNGSTEN CARBIDE

METAL CARBIDES CORPORATION
YOUNGSTOWN 5, OHIO
TUNGSTEN CARBIDE TOOLS · DIES · WEAR PARTS



Aerial view of the Liberty ship on which is based the First Aircraft Repair Unit (Floating), with helicopter on flight deck, preparing to take off. The Unit performs complete overhaul of aircraft and aircraft accessories at advanced bases until permanent facilities can be constructed.

AAF "Sail-jers" Keep B-29s Flying

FLOATING air depots—liberty ships, fully-equipped with shops for repair and maintenance of our fighting aircraft—are helping to keep Marianas-based B-29s in the Tokyo air, according to Air Technical Service Command.

Mechanics trained for their specialties by ATSC spend more of their time afloat in these highly specialized ships than they do ashore or in the air. They call themselves "sail-jers" and are supported by army and navy gunners, who protect the valuable vessels, and merchant marine crews who sail them under the supervision of the Army's Transportation Corps.

The mission of these unusual float-machine shops is to provide ready-to-operate facilities for heavy and complicated repair work, technically known as "fourth echelon maintenances", during the critical two-to-six-month period needed to set up similar facilities ashore in newly-won areas.

Although these sea-going shops have been in operation for some time, security requirements prevented announcement of their existence until recently. Known formally as "Aircraft Repair Units (Floating)", the shipborne outfits were developed by ATSC, largest of AAF commands, from an idea conceived during operations in the Mediterranean. A number of these units are doing maintenance work on Superfortresses of the 21st Bomber Command, at Saipan, Guam and Tinian.

Mechanics work on shipboard or go ashore when necessary in 30-foot work boats, "ducks", and helicopters, although if pier facilities exist or can

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Your Latest Dividend From
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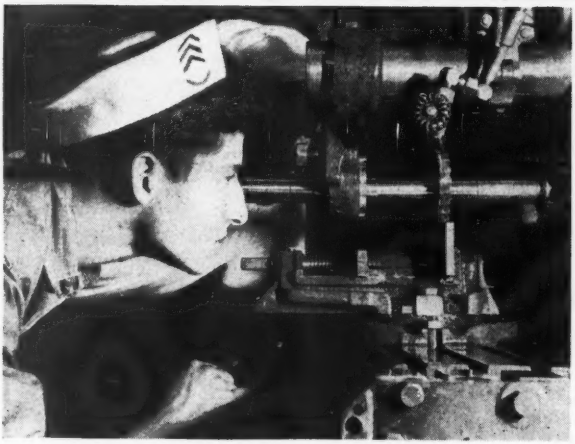
Its rock-hard adhesive bond, much more resistant to operating heat, much less sensitive to humidity, gives 25% greater output at no increase in price.*

If you have not yet experienced the outstanding advantages of DURABONDED Coated Abrasives, get in touch with our nearest branch for a prompt demonstration on the toughest job you can select.

*This is a modest average. Many reports in excess of this figure are on file.

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(DIVISION OF NORTON COMPANY)
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BRANCHES: Boston, Buffalo, Chicago, Cleveland, Cincinnati, Grand Rapids, High Point, Indianapolis, Detroit, Los Angeles, New York, San Francisco, Philadelphia, St. Louis, Tacoma



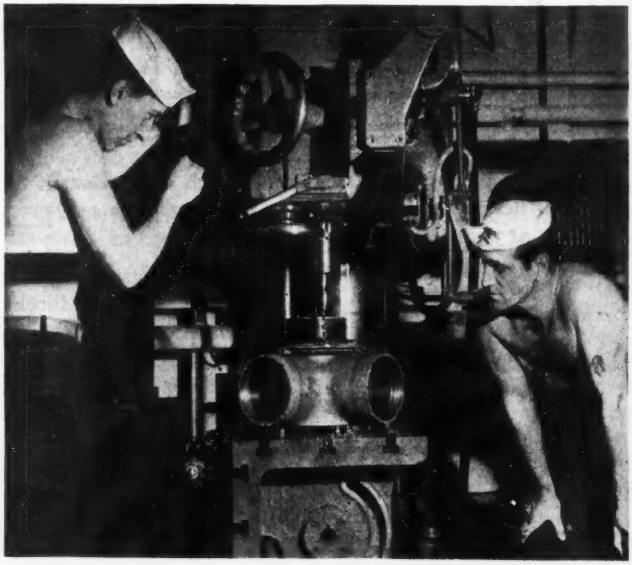
Here at work in the machine shop of the First Aircraft Repair Unit (Floating) is S/Sgt. Manuel R. Bustamante, milling a part for a B-29 Superfortress. Members of this outfit wear sailor hats and dungarees.

be built, the vessels may be docked.

The helicopters use tiny flight decks built over the forward portion of the main deck of each liberty ship. Thus when a B-29 is downed and its own ground crews are unable to repair it, experts from one of the floating repair shops may fly to the scene and assess the damage. Small assemblies and tools may be flown between ship and shore, while larger parts are transported by work boat or "duck." Or the mechanics may set up their equipment near the stricken airplane and do their work there. The helicopters are also used to speed the movement of key personnel from ship to shore installations.

The floating repair shops even have diving equipment which permits salvage work in water as deep as 250 feet.

Land-based depots, particularly those providing heavy maintenance facilities, create serious problems when a move to a forward area is contemplated. The unit has to break



Soldier-mechanics are shown here drilling a Curtiss controllable-pitch propeller hub. The machine shop is equipped for any work that may be necessary in the repair and maintenance of B-29's.

NOT ONE—BUT TWO major developments in gage block manufacture



What do these improvements mean to you?

These FONDA *"Ultra-Finish"* gage blocks are processed to such extreme surface smoothness and accuracy that they require no oil or other film for wringing. No peaks to wear off and reduce block size . . . no films between stacked blocks to introduce other errors. Faster wringing! Longer wear! And safer, surer protection for your production accuracy standards.

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FONDA *Gage Blocks*

ALSO FONDA PRECISION GAGES: Dial, Plug, Ring, Snap, Profile, Flush Pin, etcetera . . . all types except Thread gages.



A helicopter alights on the flight deck of a Liberty Ship Aircraft Repair Unit (Floating) somewhere in the Pacific. The helicopter, a Sikorsky R-4B, is used for liaison work.

curement, supply, and maintenance of all AAF planes and equipment, was given the task of providing the solution. This meant having liberty ships assigned and refitted for their new roles; selecting and training the personnel.

camp, disassemble bulky equipment, crate and box machinery and spare parts, ferry material from shore to waiting transports, load, travel to the new destination, unload, unpack and reassemble. All this requires two to six months.

The problem, first encountered in the Mediterranean campaign, with the fighting moving from North Africa to Sicily to Italy, is particularly difficult in the Pacific where continuous island-hopping is necessary.

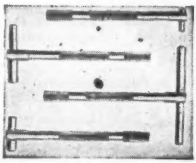
Air Technical Service Command, charged with the engineering, pro-

The soldiers selected for the job were sent to technical schools of every description for special training. At the ATSC marine training school at Fairhope, Ala., they learned abandon-ship procedure, maritime nomenclature, navigation, and swimming. The sea-going soldiers wear dungarees and white sailor hats, on which their grade is stencilled.

The floating Aircraft Repair Units are equipped with the following shops: machine, welding, sheet metal,

BRAND GUARANTEED PRECISION TOOLS

Brand Telescope Gages



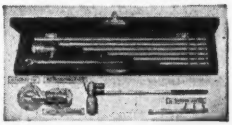
Made in 4 sizes:

AA	5/16"	to 1/2"	$2.10
A	1/2"	to 3/4"	1.80
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Set of 3 (A, B, C) w/case 7.30

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International Inside Micrometers



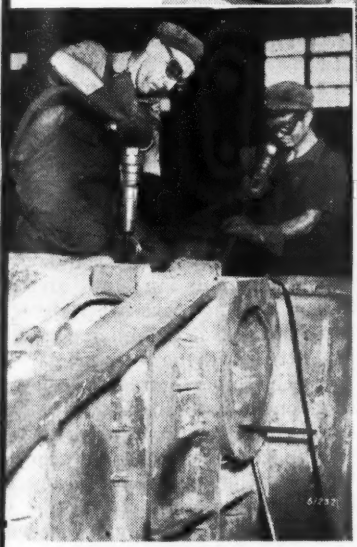
Made in 2 sets:
No. 4A 1 1/2 to 12" with case and handle ..$11.00
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Immediate Delivery

Also M & L Precision Tapper—Sine Plates and Bars
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BRAND TOOL & SUPPLY CO., 502 W. WASHINGTON, LOS ANGELES 15, CALIF.

THE Chips TELL THE STORY







The evaluation of work actually done by a chipping hammer.

If someone told you that your chipping hammers were operating at only 60% cutting efficiency, you wouldn't believe them. Yet it has been found that even good operators cannot be relied upon to find 20% or less difference in the cutting ability of a group of hammers. That difference must be found by measuring the actual metal removed.

Recently a large plant asked our "cutting efficiency service" engineers to check their hammers. Tests soon showed that most of them were in very poor operating condition, so all types were shipped to our factory for a standard comparison cutting test against master hammers. Reports showed that they varied from 40% to 70% low in C. E. and were 6% high in air consumption.

From the tests it was obvious that the continued use of these hammers would cost thousands of dollars. Those beyond economical repair were replaced with I-R Flapper-Valve hammers and the balance were repaired as outlined by our service engineers. Production costs were reduced and more chipping per operator resulted.

An I-R service engineer will be glad to show you how to maintain the highest cutting efficiency for your hammers. A copy of our handy two-color Chipper Repair Wall Chart is yours for the asking.

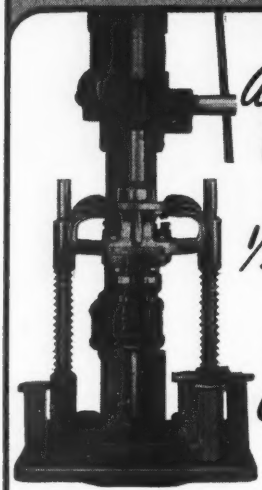
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TWO SPINDLE *Adjustable* DRILL HEADS

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✓ *Adjustable Centers from 1/2" to 6"*

✓ *Drill Capacity 0 to 5/8"*

Sleeve and overarm types . . . in several sizes. Will double output of any single spindle drill press.

Quickly adjusted to desired drill centers from ½" to 6".

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heat treating, electro-plating, ordnance, turret, ground and airborne radar, radio, camera repair, propeller, carburetor, turbo-supercharger, electrical, paint-dope-and-fabric, woodwork, instrument, bombsight, tire, fuel, cell, parachute rigging, and drafting. There is also a plant for generating aviator's breathing oxygen.

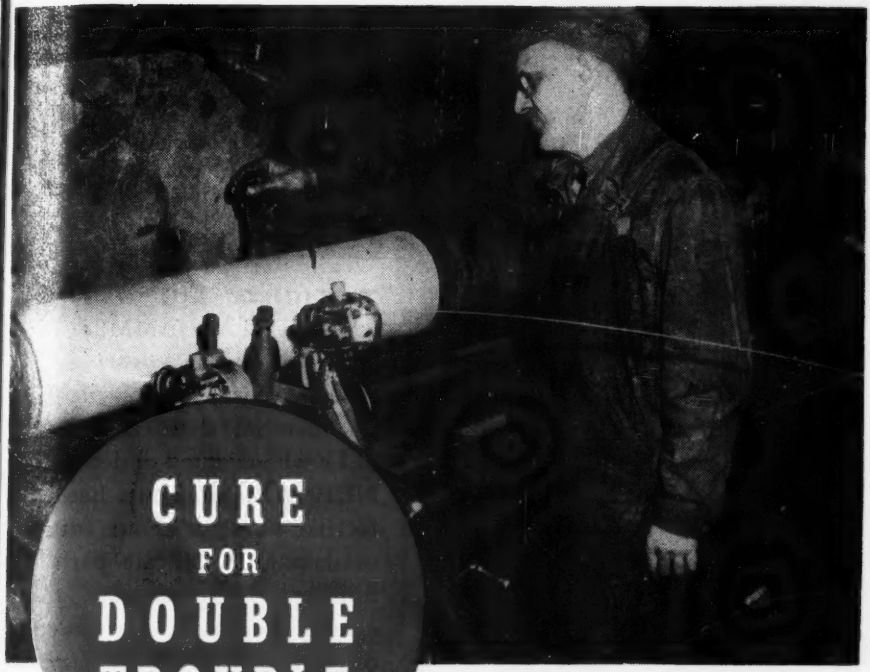
In addition to its maintenance facilities, each ship has its own hospital, chaplain, finance officer, intelligence officer, orderly room, messing facilities, sleeping quarters, laundry, "PX", post office, and brig.

The only work which the floating air depots are not equipped to perform is engine overhaul. There isn't sufficient room on shipboard to set up a line for the disassembly, cleaning, replacement and rework of parts and reassembly of engines.

Work boats, 2½-ton "ducks", and jeeps with trailers are carried right on the ships. A communications section enables crews which have left the mother ship on repair missions to keep in touch with their headquarters and vice versa, and provides communication between tactical and service organizations in the area.

While the floating Aircraft Repair Units with the 21st Bomber Command are fitted and manned primarily to service Superfortresses, they also work on other aircraft. Their men have helped repair fighters and transports in the area of their operation; in fact, they can handle anything that comes along.

As the invasion moves even closer to Japan, the Floating Repair Units may follow in their wake, servicing airplanes supporting ground forces, and striking against the Nipponese economic and military establishment. No time is lost, for, unlike their land-based counterparts, these 10,000-ton liberty ships are ready for operations the moment they reach their destination.



CURE FOR DOUBLE TROUBLE

Both propeller shafts of the twin-screw tow boat "Paul Blazer" needed resurfacing—in a hurry. The job called for hard stainless steel at the stern tube packing area. Every hour saved counted heavily, because these vessels are urgently needed for transporting oil and gasoline. Using two METCO Type 2E Guns—each Power Control equipped and capable of spraying 10 lbs. of 3/16 in. stainless steel an hour—shop men had these much-needed shafts ready for service again in double-quick time. Details in METCO NEWS, free on request.

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MIGHTY BUT GENTLE—NUPLA HAMMER uses a *new plastic discovery* called "Flex-O-Cryst," a semi-soft flexile material that HEALS ITSELF when dented or deformed. NUPLA Hammer hits hard effective blows without cutting or damaging delicate parts or finishes. *More durable than rawhide* because it does not curl or permanently deform. *Unlike rubber,* will not rebound: not affected by oil or gasoline. Will not support combustion or explode. Will not chip or crack.

Every skilled craftsman wants and needs a Nupla Hammer.

3 sizes and 7 weights

SOLD AT HARDWARE STORES EVERYWHERE; write for name of local dealer.

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MIGHTY *but Gentle* **NUPLA** PLASTIC HAMMERS

METAL *Stampings* DUPLICATED WITHOUT DIES



With DI-ACRO Precision Machines

If you desire to save time and critical materials on production of metal stampings or other small parts, then the DI-ACRO System of "Metal Duplicating Without Dies" merits your consideration. It is based on the rapid and accurate production of formed parts with DI-ACRO Shears, Brakes and Benders. All duplicated work is accurate to .001". These precision machines are adaptable to an endless variety of work, and ideally suited for use by girl operators. For short runs your parts are processed in a matter of hours instead of waiting weeks for dies.

SHEARS

Di-Acro Shear squares and sizes material, cuts strips, makes slits or notches, trims duplicated stampings. Shearing width—Shear No. 1—6". Shear No. 2—9". Shear No. 3—12".

BRAKES

Di-Acro Brake forms non-stock angles, channels or "Vees." Right or left hand operation. Folding widths: Brake No. 1—6". Brake No.2—12". Brake No. 3—18".

BENDERS

Di-Acro Bender bends angle, channel, rod, tubing, wire, moulding, strip stock, etc. Capacity—Bender No. 1—$\frac{1}{8}$" round cold rolled steel bar. Bender No. 2 and No. 3—$\frac{1}{2}$" cold rolled steel bar.

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"DIE-LESS DUPLICATING"

It illustrates many stampings or parts made without dies, gives full details on DI-ACRO machines and shows how they may readily be adapted for various applications. Request your copy now.



DI-ACRO PRECISION MACHINES DIE-LESS DUPLICATING

← Pronounced "DIE-ACK-RO"

O'NEIL-IRWIN MFG. CO.

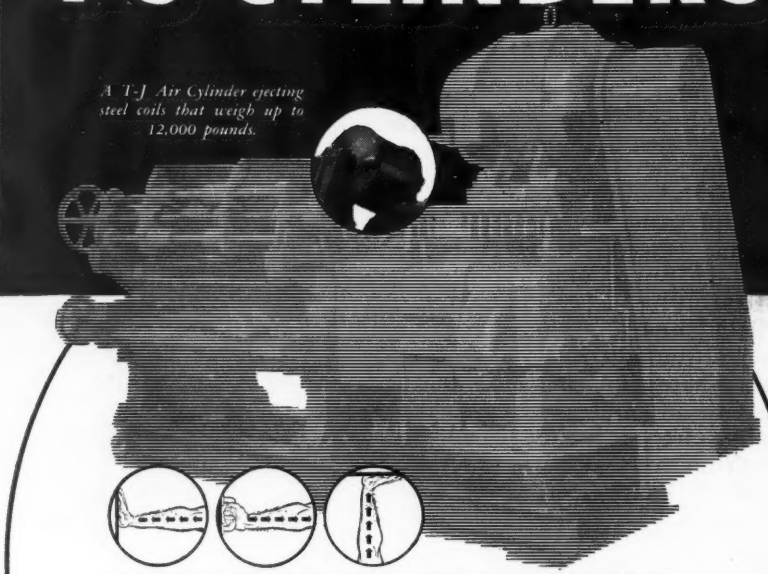
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T-J CYLINDERS

A T-J Air Cylinder ejecting steel coils that weigh up to 12,000 pounds.



FOR PUSH-PULL-LIFT JOBS...100 LB. OR 50,000 LB.

Harness T-J Cylinders to your tough jobs of power movement—to improve performance of machines and equipment!

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FOR TOUGH JOBS SPECIFY T-J

TOMKINS-JOHNSON

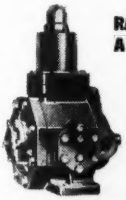
RIVITORS . . AIR AND HYDRAULIC CYLINDERS . . CUTTERS . . CLINCHORS

DUAL FEED . . .
and why you need it

RACINE's exclusive "Dual Feed" consists of Positive and Flexible Feed, progressively applied — hydraulically controlled. Round bars, odd shaped pieces, tubing and free cutting stock require a compensating type of feed for maximum cutting efficiency. RACINE's "Flexible Feed" automatically picks up speed as the resistance to the blade decreases. You benefit by increased output.

With "Positive Feed" on your RACINE Machine, all cuts are made in exactly the same time, predetermining production. Our dealers and factory engineers will make up recommendations without cost to you.

Free Catalog No. 12 describes the various machines in capacities from 6" x 6" to 20" x 20". Write today.

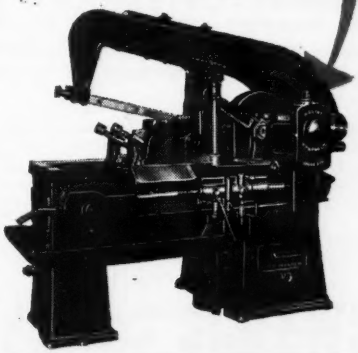


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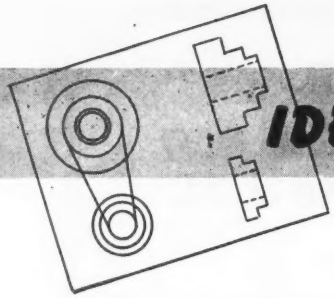
- ★ The RACINE Machine line is complete — all capacities from 6" x 6" to 20" x 20"
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IDEAS FROM READERS

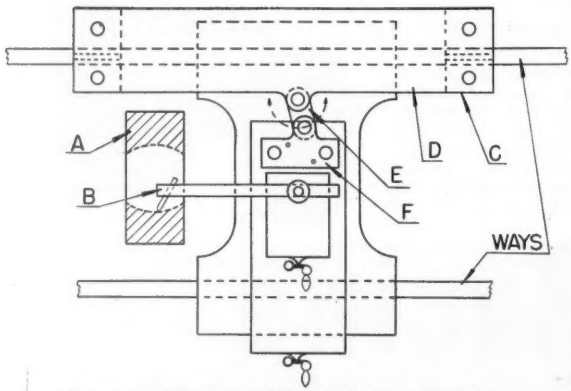
A Good Tool for Contour Boring

By A. C. SCHMIDT

THE ACCOMPANYING drawing illustrates the design of a tool that was developed at our plant to machine an internal radius. We had previously tried to form this radius with a form tool, but inasmuch as both the tolerance and the form were critical we ran into much trouble. Using the simple attachment shown here, the contour is determined by the fixture itself and the diameter can be held to close limits by the use of the compound.

The work **A** is held in a lathe chuck in the usual manner, while the boring tool **B**, mounted in the tool holder, bores the radius. Two vee blocks **C** are clamped to the rear way of the machine, spaced far enough apart to allow the necessary travel for the carriage. To the vee blocks a flat plate **D** is bolted, the vee blocks holding the plate high enough to allow the carriage to move underneath. The plate **D** has a link-pin hole jig-bored in the center of the side facing toward the toolpost as shown in the drawing.

A bracket, **F**, is bolted and doweled to the rear end of the cross slide so that a connection can be made between the bracket **F** and the plate **D** by the link **E**. The center-to-center distance between the pin holes in the link must be the exact dimension required to hold the dimensions of the radius in the workpiece to the required limits. With the cross slide lead-screw disconnected, as the carriage is fed longitudinally the movement of the cross slide is controlled by the link **E**, producing the desired contour in the work. The diameter of the radius is easily controlled by the use of the compound rest.



Drawing of Device for Radius-Boring in the Lathe



OUT GOES SPOILAGE!

Hamstrung by work-spoiling driver skids while he used slotted screws, a certain radio cabinet manufacturer made a complete switch-over to Phillips Recessed Head Screws. Result: production shot up like a rocket!



DOWN GO COSTS!

With this upward swing in production, there was a consequent *downward* swing in costs. A downswing that was helped along plenty by the fact that Phillips Screws drive up to 50 percent faster!



UP GOES STRENGTH!

On production . . . on costs . . . yes, also on design, . . . use of Phillips Screws makes a big difference. Engineered for heaviest driving pressures, they help designers plan exceptional strength and rigidity into products!



AWAY GOES SALES RESISTANCE!

Saleswise, too, use of Phillips Screws pays off. They not only add to a product's strength, smartness, and general good looks. They also banish burrs that snag clothes and sidetrack sales!

It's Phillips . . . the engineered recess!



In the Phillips Recess, mechanical principles are so correctly applied that every angle, plane, and dimension contributes fully to screw-driving efficiency.

. . . It's the exact pitch of the angles that eliminates driver skids.

. . . It's the engineered design of the 16 planes that makes it easy to apply full turning power – without reaming.

. . It's the "just-right" depth of recess that enables Phillips Screw Heads to take heaviest driving pressures.

With such precise engineering, is it any wonder that Phillips Screws speed driving as much as 50% – cut costs correspondingly?

To give workers a chance to do their best, give them faster, easier-driving Phillips Recessed Head Screws. Plan Phillips Screws into your product now.

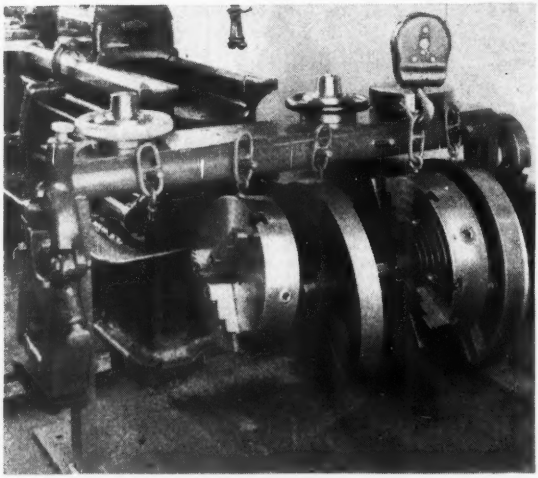
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International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
Manufacturers Screw Products, Chicago, Ill.
Milford Rivet and Machine Co., Milford, Conn.
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N. H.
Parker-Kalon Corp., New York, N. Y.
Pawtucket Screw Co., Pawtucket, R. I.
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The Steel Company of Canada, Ltd., Hamilton, Canada
Wolverine Bolt Co., Detroit, Mich.



Stand Designed for Storage of Lathe Accessories

Practically any radius desired, within the limits of the lathe, can be cut by using links made to the required dimensions.

Lathe Chuck Stand

(Courtesy General Electric Company)

THE LATHE chuck stand shown in the illustration, devised by the Supercharger Division of General Electric's Lynn River Works, facilitates the storing of chucks between jobs. The stand is a compact device that saves time and space, and keeps the chucks up off the floor—which always makes for order and cleanliness in the shop. The stand is usually located at the end of the lathe where it will be handy for storing not only chucks, but also faceplates, steadyrests, and dogplates.

The frame of the stand consists of two channel steel uprights, each approximately 3 x 1½ x 27 inches. Each is anchored vertically to a ¾ - inch base plate 24 inches long and 4 inches wide. Across the top of the uprights is a section of 3-inch pipe which is welded to the uprights to form a solid structure. In the horizontal section, evenly spaced, are five pegs, with an additional peg projecting from the frame at each end, to hold the chucks and other accessories. An 8-inch shelf, cut from ¼-inch plate and supported by triangular-shaped gussets, is attached to the back of the horizontal section. For convenience in holding various chuck tools, 16 holes of 1-inch diameter, evenly spaced, are drilled in the shelf.

Of special interest is the combina-

HYBCO GRINDING HEADS

For Universal Tool and Cutter Grinders.

CHAMFER SHARPENING HEAD

Accurately Relieves Chamfers of TAPS—STEP DRILLS—CORE DRILLS—COUNTERSINKS—similar tools with evenly spaced flutes.

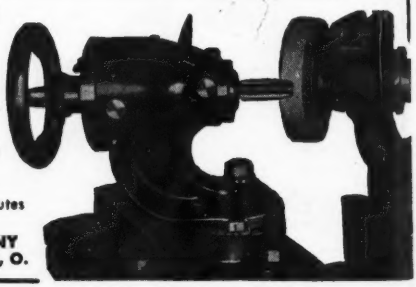
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Quick-As-Wink



On automobile core machines, positive control is essential.

The Quick-As-Wink hand operated 4-way compound exhaust valve controls the inner and outer movement of the two horizontal cylinders. The hand-operated 3-way Quick-As-Wink valve controls the upward movement of the center vertical cylinder.

C. B. Hunt & Son manufactures solenoid, hand, foot, and diaphragm operated valves for air, also hand and pilot operated hydraulic types for water or oil applications up to pressures of 5,000 pounds, in standard and special sizes.

This automobile core machine is a product of The Tabor Manufacturing Co., Philadelphia, Pa. Two Quick-As-Wink valves assure positive air control.

The Hunt catalog carries complete, easy-to-use engineering data. Write for a copy.

THE HIGHER THE PRESSURE
AIR
WATER
OIL
THE TIGHTER THE SEAL

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tion double link and eyebolt used to suspend the chucks and other tools from the pegs. The link is about 5 inches long and 2 inches wide, with a bar crossing through the middle. It is intended that the upper part of the link shall be used for the crane hook so that the lower part can be guided onto one of the pegs in the stand. The crane hook can then easily be released from the link.

High Production Reaming

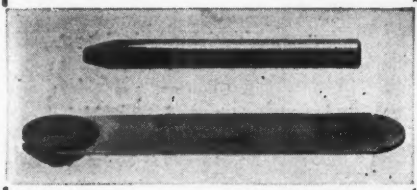
By R. A. Shaw

MY ATTENTION was called recently to a reaming job the features of which are high production and a minimum of cost for tooling. The idea is also used for such operations as burring and tapping.



Using a Procunier Tapping Machine for Reaming, with a Collet Chuck to Hold the Work

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For Removing Burr or Chamfering Holes and Slots of Fork-Shaped Parts.

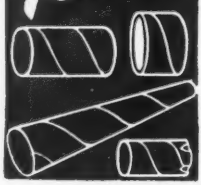
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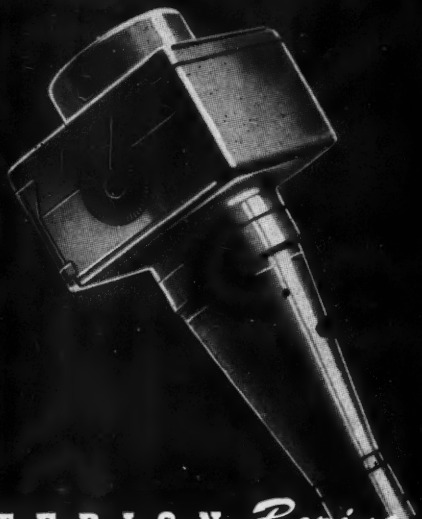
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#7 B & S; #2 M. T. S. OR AS SPECIFIED.



ADAPTER TO FIT MACHINE. CLAMPS ON MACHINE AND ADAPTER SOLID AS A ROCK.

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A number of mold makers, both plastic and die casting, have requested us to make a 90° head to go on their milling machines, for those jobs they could not do with their present vertical and horizontal machines, in milling hard-to-get-at cavities in molding dies.

Well, we have met that request, and your milling machine heads are ready to go to work. The orders that mold makers are sending us, by wire, by phone, by mail—and the satisfied letters that come back, are proof—**You need it too.**

Deliveries—Two Weeks.

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6111 EIMPIRE BLDG., PITTSBURGH 22, PA.

Makers of Job Tested and Job Proven Tools

The job consisted of a single reaming operation on a small workpiece, several of which can be seen in the illustration. The job was set up on a Procunier tapping machine, and the holding fixture is designed to hold a single piece in a collet chuck. The chuck is operated by air and is controlled through a foot lever. As the piece is released after reaming, it is expelled by air from the chuck; thus the operator is required only to feed the work into the chuck.

To change the collet for work of different sizes, the top retaining ring is removed and the collet is quickly removed and replaced.

Tools of this type will do much to aid in the change-over program from war to peace-time production.

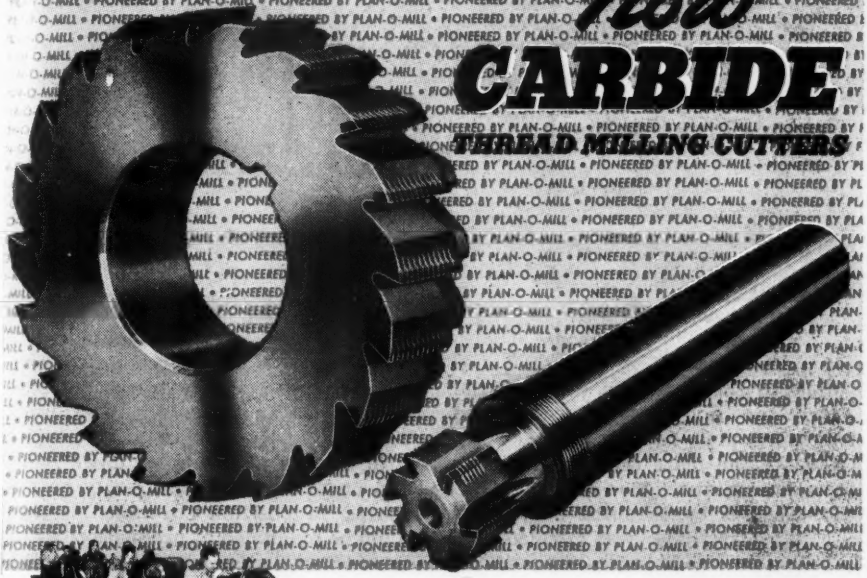
Special Chuck to Machine Caps

By Michael Axler

WE HAD A number of caps of the design shown in Fig. 1 which were to be drilled and tapped as indicated at **A** and counterbored as shown at **B.** It was important that the thread **A** and the counterbore **B** be true with the face and periphery of the shoulder **C.** Inasmuch as the caps were supplied in lots of two dozen at a time, it became evident that it would be too costly to clamp each one in the lathe chuck individually, using an indicator to true the surfaces. Accordingly a fixture was made to expedite the job.

To make the fixture, a piece of ¼ x 4-inch soft steel 7 inches long was formed as shown at **A** in Fig. 2, and was then welded to a flat piece of steel ½x4x7½ inches long, as shown at **B.** Two holes, **C,** were drilled in plate **B** so that the plate could be

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Now, to the proven speed and accuracy of thread milling, Plan-O-Mill brings you the proven *extra* advantage of cemented carbide. This tough, wear resistant material, forming the cutting edges of Planco Carbide Thread Milling Cutters, gives you greater accuracy, greater speed, and many more parts per grind. No tooling change is necessary.

Planco Carbide Thread Milling Cutters are available in National, Whitworth, Acme, V, and special forms, with or without provision for the Higbee cut. Both shank and shell type cutters are offered.

For increased production with maximum savings in time, money, and manpower—tool up today with Planco Carbide Thread Milling Cutters!

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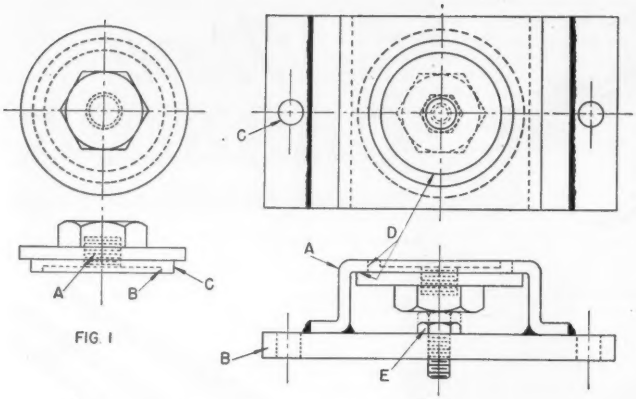


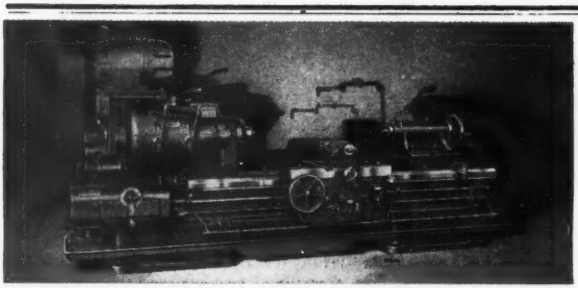
FIG. 1

FIG. 2

Drawing of Fixture Designed for Machining Caps

bolted to the faceplate of the lathe. After the holes had been drilled, two dowel pins, not shown, were used to locate the plate on the face plate, then the fixture was machined as shown at **D** to take the cap.

Finally, a hole was drilled and tapped in plate **B** for the capscrew **E**, which could be backed up against the workpiece to hold it in position for machining. By screwing the capscrew down, the workpiece could be removed and replaced as required. The fixture could easily be aligned with the aid of the taper dowel pins, and once aligned, could easily be anchored in position so that the caps could be machined at production rates.



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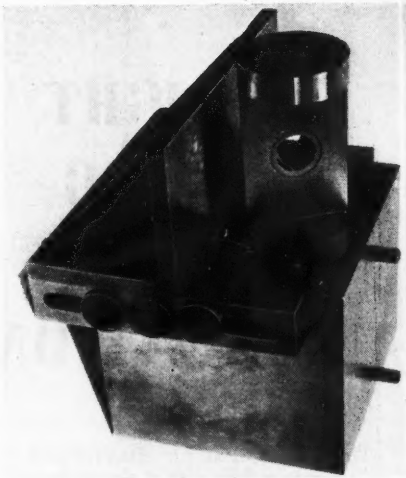
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Convair Develops Precision Drill Tool

(Courtesy Consolidated Vultee Aircraft Corporation)

TO facilitate the drilling or reaming of holes within precision limits with an ordinary electric drill or hand reamer, a special tool has been developed by James L. Spivey and Stanley W. Heneghan of Consolidated Vultee Aircraft Corporation. The tool also makes it possible to locate holes to be drilled or reamed at any angle, with regard to a given base, in an extremely short period of time.



Tool Developed at Convair to Simplify Drilling and Reaming Operations

Essentially, the tool consists of a base block into which a precision cylinder is fitted so that it can be adjusted axially and rotationally with the aid of lock screws. The cylindrical section is made integral with a flat section the surface of which is on the exact centerline of the cylinder, and in the exact center

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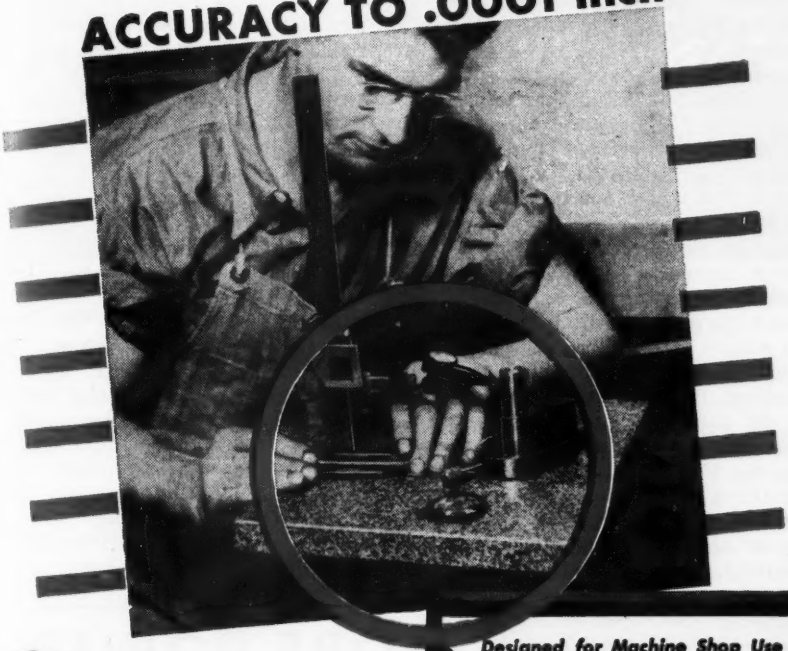
It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in $\frac{1}{16}$" to 1" diameters. *Send for price list.*

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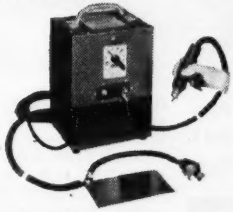
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Other Machine Tool Accessories include: Dust Collectors, Live Centers, Lathe Chucks, Demagnetizers, Grinding Wheel Dressers, Balancing Ways.

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of the flat surface is a bushing. The axes of the cylinder and bushing are exactly 90 degrees to each other in all directions.

Attached to the base block with suitable screws is a sliding block carrying a base angle plate which is also attached with screws. The base plate may be adjusted vertically with relation to the block through a suitable slot and screw holes.

In use, the desired clearance for the workpiece beneath the bushing is obtained by adjusting the base angle plate, and the desired drilling angle is located simply by rotating the cylinder and its integral plate carrying the bushing. The workpiece is supported by the base angle plate so that it can be drilled or reamed through the bushing.

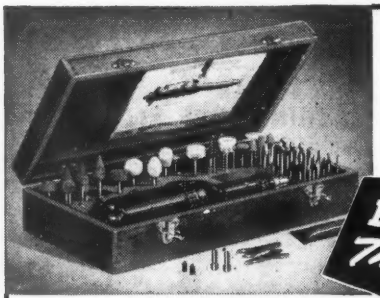
By making it possible, with the aid of this tool, to drill or ream a wide variety of holes in correct locations at a variety of angles and in a minimum amount of time, jobs that formerly would have required a milling machine or jig boring machine are reduced to simple bench operations. The tool also facilitates the inspection of the work upon which it is used by making it possible to check each job by means of an ordinary plug gage.

Rack for Plug Gages

(Courtesy Westinghouse Electric & Mfg. Co.)

THE ILLUSTRATION shows a rack that was designed by a Westinghouse employee to hold three large plug gages and keep them clean and safe from injury by being "banged" against other tools, or against each other.

The gages were previously stored on benches where they were exposed to damage from corrosion and handl-



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35,000 R.P.M. UNDER LOAD!

PRECISE Thirty-five



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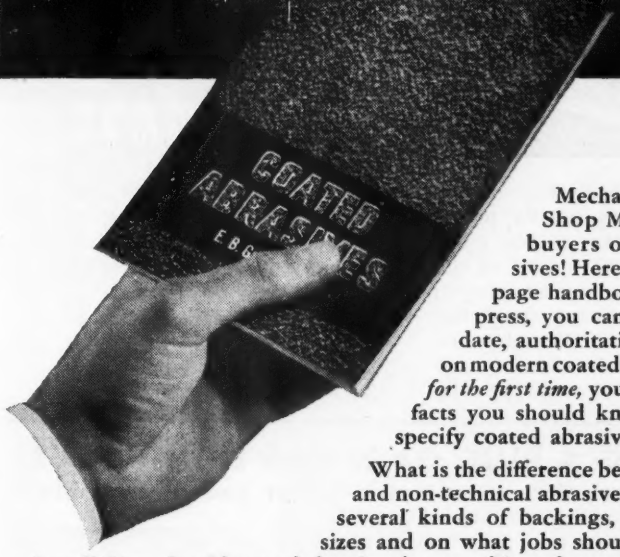
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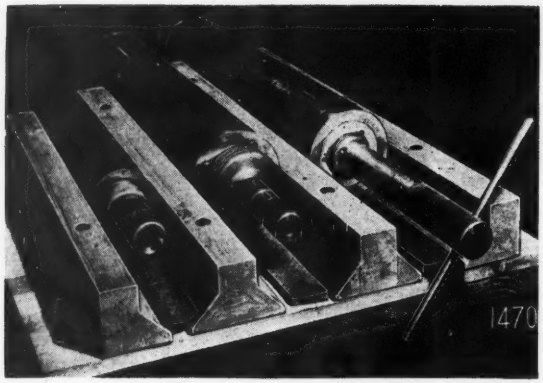
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These large Plug Gages are Protected from Damage by Storing Them in a Wooden Rack that Keeps Them Separated. Each Plug Rests on a Strip of Oil-Soaked Felt

ing. Any rust that formed on the gages had to be removed by polishing with crocus cloth. If the gages were scratched while lying on the bench or during use, the cleaning-up process thus necessitated could ruin them by reducing the diameters below the allowable tolerances.

To protect their surfaces, the gages rest on oil-soaked felt strips between dividing partitions which keep them from being knocked together. For purposes of illustration the gages were moved to the rear of the rack so that the construction could be seen in the photograph. Before use, each plug is revolved once or twice on the oil-soaked felt to remove any dust and lubricate the plug.

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MEASURING A PLUG GAGE *with* LIGHT WAVES

using an optical flat, a toolmaker's flat and a gage block

The formula is:

$$D = h + \frac{(.000012 \times N \times W)}{w}$$

Substitute the actual values

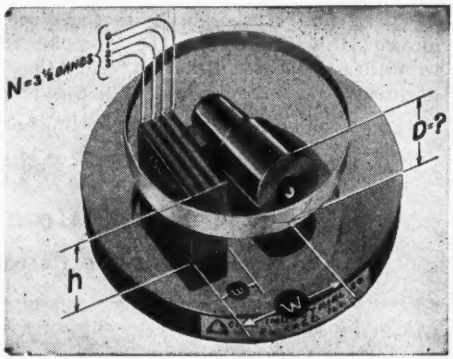
$$D = .750 + \frac{(.000012 \times 3\frac{1}{2} \times 1\frac{7}{16}")}{\frac{33}{64}"}$$

and get the answer

$D = .750168$ inch.

It's just that simple!

Write for new, free Lightwave Measurement Booklet.

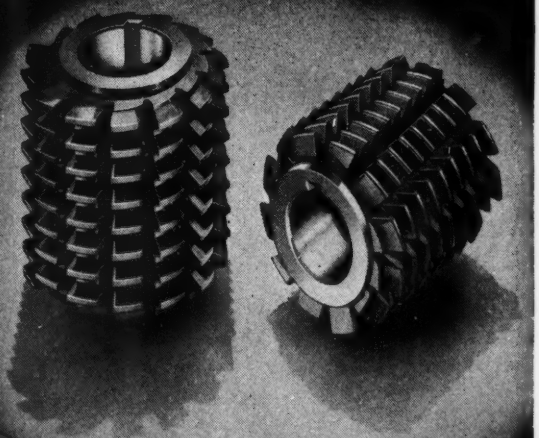


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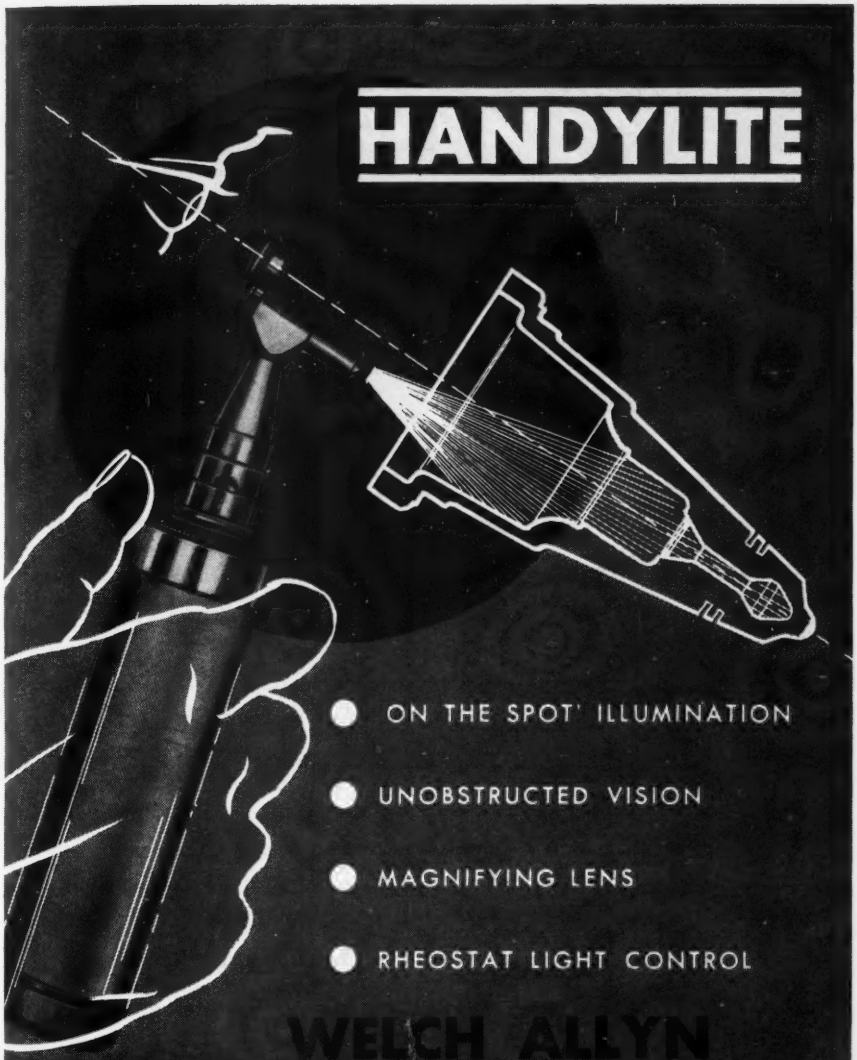
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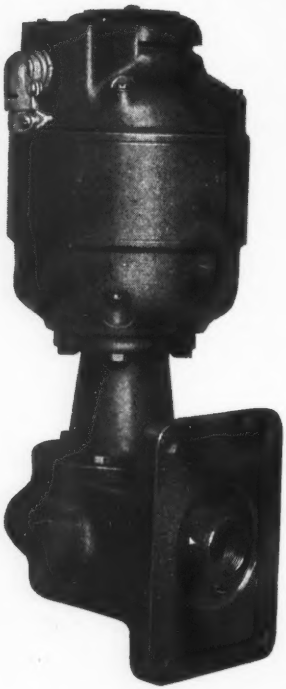
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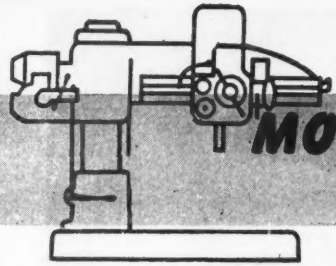


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This 300-Foot Conveyor in the Willys-Overland Plant Carries More than 1,500,000 Spare Jeep Parts through the Packaging Department

Recent "streamlining" of packaging methods by Willys engineers has resulted, in addition to a tripling of shipments, in a 20 per cent cost reduction and a large saving in manhours. Before they reach the packaging department, the parts are now washed, dried and treated with a rust-preventative oil through an automatic system capable of handling 40 tons an hour.

Magnetic-Automatic Coolant Separator Aids Honing Operation

IN order that the hydraulic mechanisms used on the dump trucks made by the Heil Company, Milwaukee, Wisconsin, may operate with the maximum smoothness and efficiency, this firm finishes the bores of the hydraulic cylinders by honing them in a vertical hydraulic honing machine.

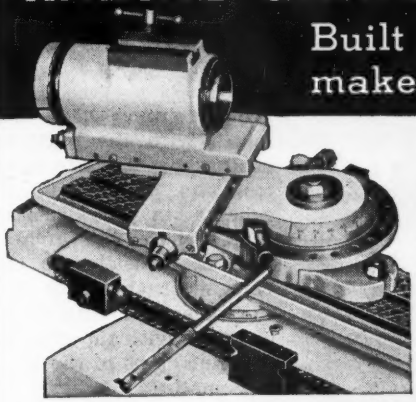
The machine is a Barnesdril, 116½ inches high overall, having a spindle travel of 50 inches. The cylinders are of steel, 28⅜ inches long, and finish to 7.179 inches diameter in the bore. Approximately 0.010 inch of stock is removed, which is accomplished in eight minutes.

An interesting feature of the machine is the Magnetic-Automatic

Knock-Out

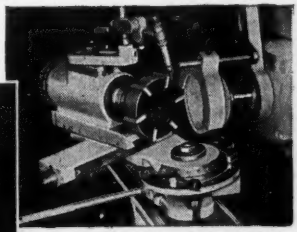
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Built for use on most any make Tool Grinder



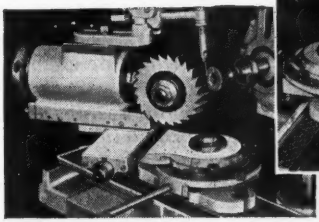
Difficult radial grinding jobs are made easy with this fixture.

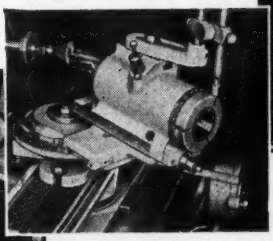
Designed to accommodate cutters from 3/16" to 10" in diameter.



Grinding radius on 4" Insert Tooth Face Mill

Grinding radius on 4" Milling Cutter





Grinding radius on Spiral End Mill



IF IT'S MADE BY LEE IT'S A *Knock-Out*

The *Knock-Out* RADIAL GRINDING FIXTURE is NEW! Straight and tapered sleeves, collets, and chucks can be employed permitting most any type of cutter to be handled. Radii from the smallest to those of sizeable dimensions can be ground with accuracy and ease. Constructed in ball bearings, this fixture can be used as a Sensitive Ball Bearing Work Head as well as for grinding radii. Net weight, 40 lbs.



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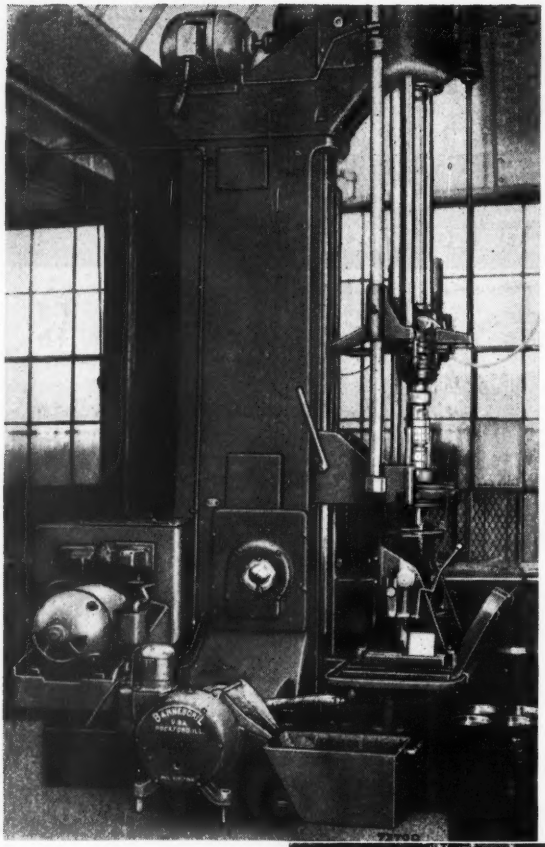
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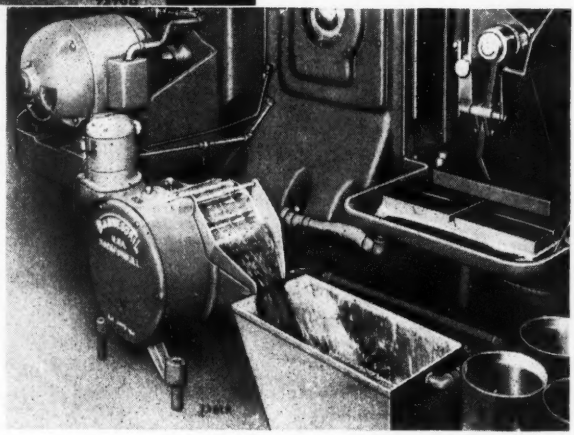
ABERDEEN, SOUTH DAKOTA



Cylinders for the Hydraulic Mechanism used on the Dump Trucks made by the Heil Company, Milwaukee, Wisconsin, are honed in this Barnesdril Vertical Honing Machine. The machine is Equipped with a Magnetic-Automatic Coolant Separator which Removes the Swarf from the Coolant Automatically

ground from the work, mixed with the particles of abrasive that are worn from the grinding wheel, collects in the coolant tank, where the greater part of it settles to the bottom of the tank and the balance continues to circulate with the coolant. The fine chips in the coolant make it difficult to obtain a good finish on the work, and it frequently happens that the desired finish is impossible to obtain until the coolant is cleaned or changed. Frequent stops to change the coolant result in reduced production and increased costs.

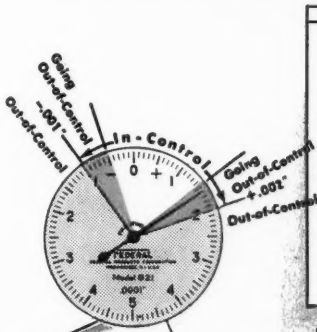
The mechanism of the coolant Separator which removes the grinding swarf from the coolant. Unless removed, the swarf, consisting of the minute steel particles that are

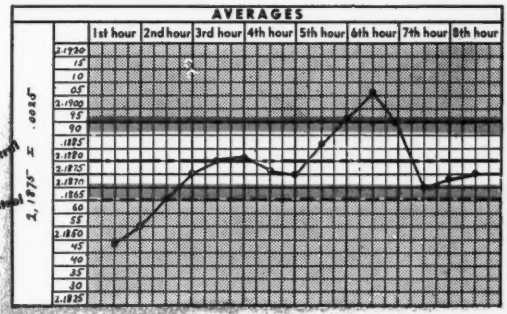


Close View of Magnetic-Automatic Coolant Separator on Honing Machine. Permanent Magnets Inside the Revolving Drum Attract the Particles of Swarf to a Non-Magnetic Surface Sheet, from Which They Are Automatically Scraped

DIMENSIONAL *QUALITY CONTROL

Locks the Barn Door BEFORE the Horse Is Stolen







This Federal Q.C. Primer furnishes a simple and practical method of *applying* Dimensional Quality Control with the detailed theory eliminated.

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Statistical methods of controlling dimensions build quality into the product by employing control over the variables which exist during its production. Only by the use of Indicating Gages is it possible to obtain the necessary data at production. Fixed or old style Gages can't, because they do not tell *how much* the same dimension *varies* on each workpiece.

Much theory has been associated with Statistical Quality Control. Federal has prepared and furnishes a Primer — a simple practical method of applying this modern method of building dimensional quality into your work at production.

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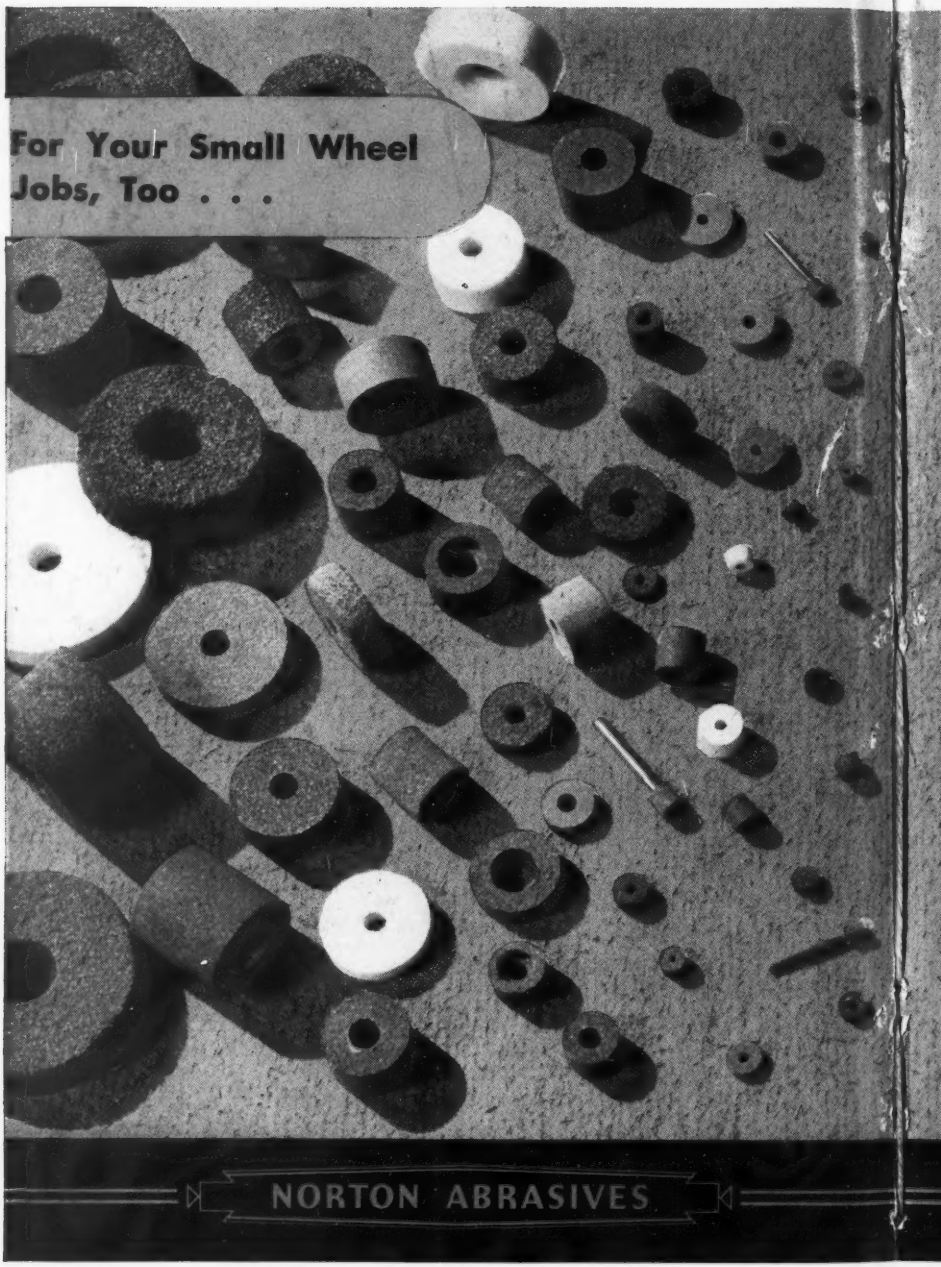
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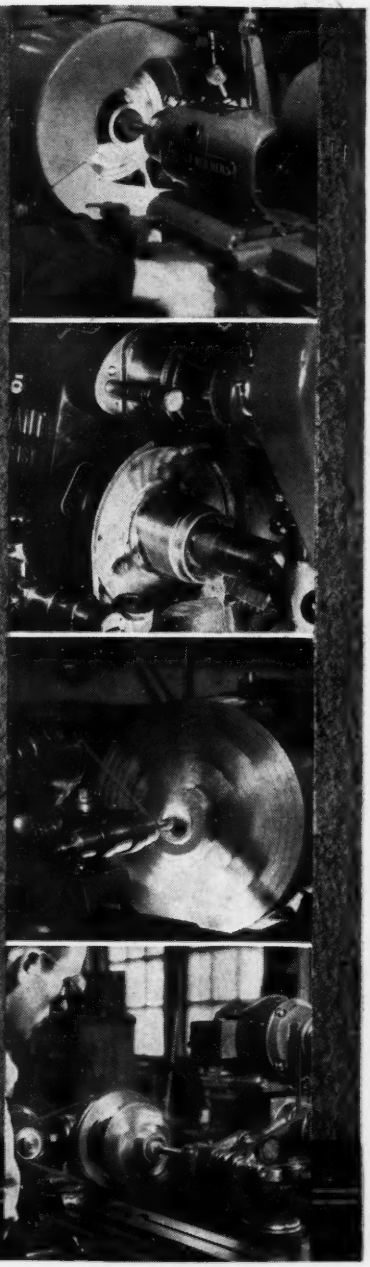
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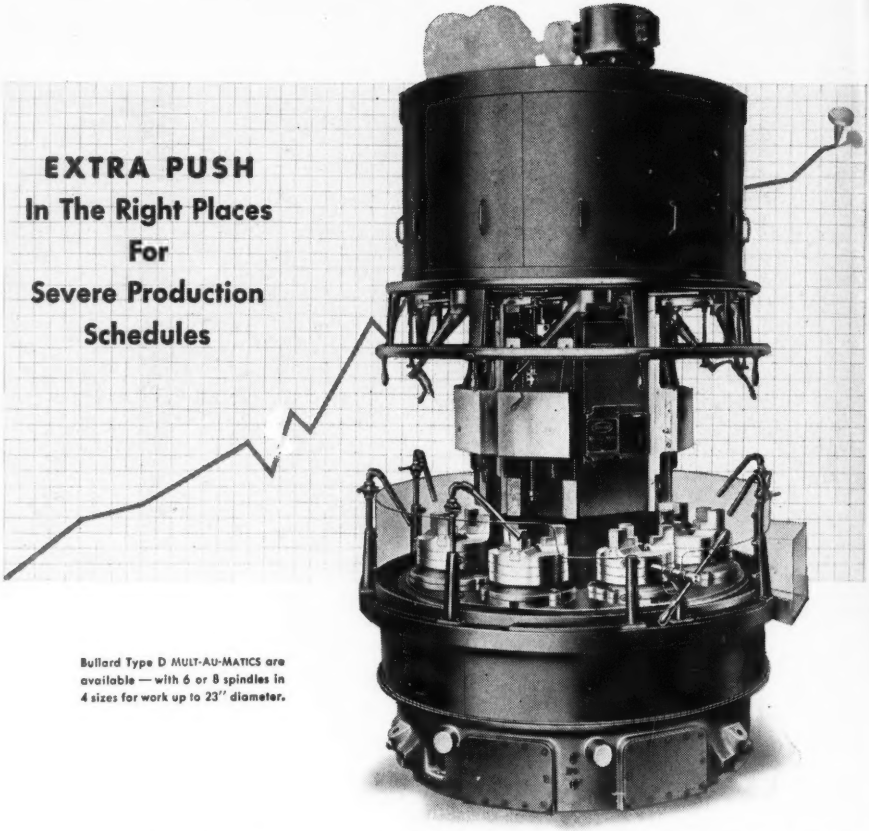
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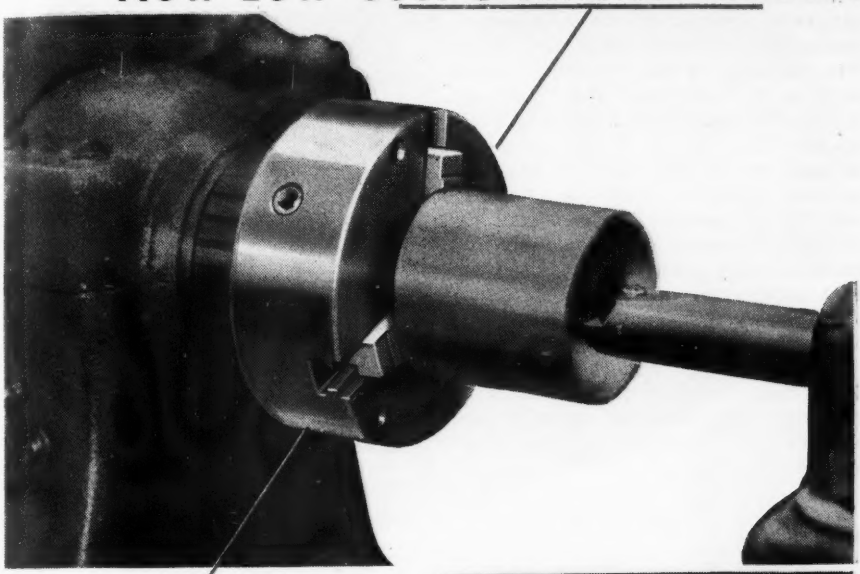
From the rugged base and sturdy carrier that guards alignment accuracy, up through the rigid column to the feed works that assure complete coordination of spindles, tool-carrying heads and indexing . . . this unified heavy construction is accurately controlled to meet every demand for efficient operation.

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3-jaw self-centering type chuck. Two sets of jaws (ground to close tolerances) furnished with each chuck, for internal and external work. Precision made for accuracy and fast chucking. Available with 1½"-8 threaded body, or with mounting adapter.

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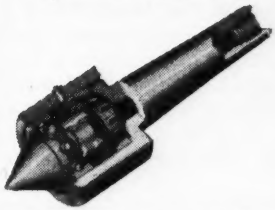
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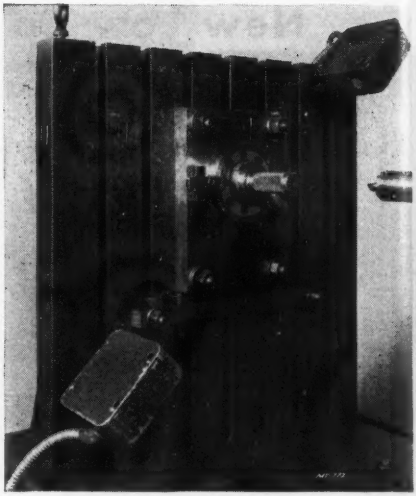


Handle heavier loads—permit deeper cuts at higher speeds because they rotate with the work. The special bearing construction assures accurate turning for precision jobs. Four inserts are easily and quickly interchangeable for centered or uncentered work. Accepted as standard in all leading tool and machine shops.

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automatic separator includes a drum which has a series of permanent magnets mounted all the way around inside and rotating with the drum. The outside of the drum is faced with a non-magnetic sheet through which the magnets attract and hold, to the face of the sheet, all magnetized swarf and most of the suspended abrasive, which is strained out by the swarf. As the drum revolves, the swarf is continuously and automatically scraped off the drum and discharged into a receptacle, from which it is removed at regular intervals.

The result is that the coolant is kept clean without the necessity of stopping the machine, and a fine, smooth finish is obtained in the bores of the cylinders.

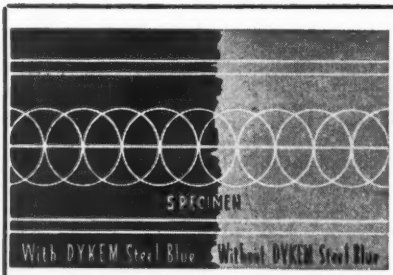


While the beam from the light at the upper right is interrupted by the handle of the plug gage, or by the hands of the operator, the machine cannot be started.

Light Beam Prevents Accidents

THE boring tool which can be seen projecting into the accompanying picture from the right won't move in to finish bore the blank for a high-precision Cone-Drive gear mounted on a universal faceplate in a Simplex Boremetic at the plant of Michigan Tool Company, Detroit, as long as the aligning plug is in position, or even while the operator is in the act of inserting or removing the plug from the workpiece.

The light beam from the transmitting light, upper right, to the photo-electric cell, lower left, is interrupted by the handle of the plug, and the circuit is so arranged that the machine cannot be started while the light beam is interrupted. The use of the photo-electric cell prevents possible injury to both hands and equipment through accidental starting of the machine.



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Stops Losses in Making Dies and Templates

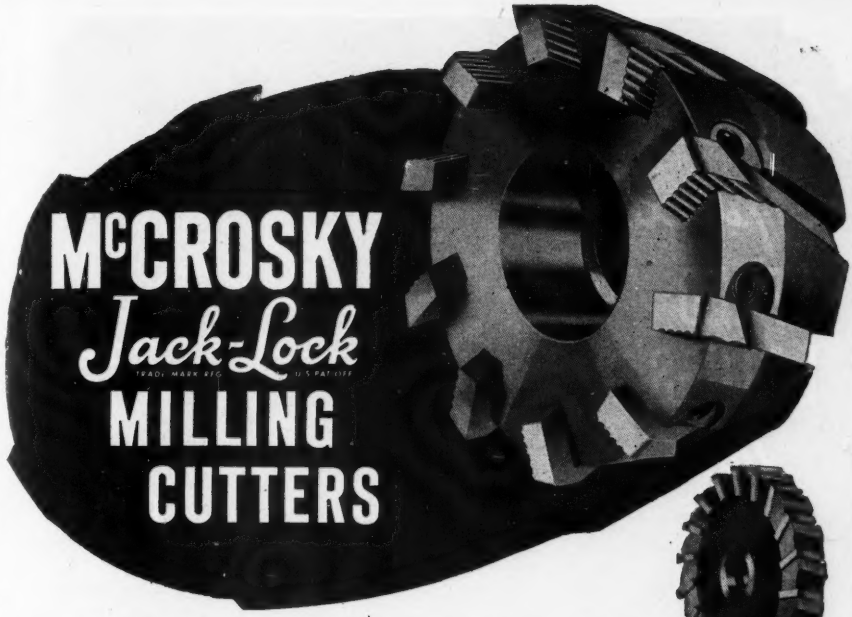
Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

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Specify McCrosky service-proved Jack-Lock Cutters, and get—in your plant—all the design, construction and operating advantages only McCrosky Jack-Lock Cutters can give you.



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Block Type BORING BARS
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Super Adjustable REAMERS
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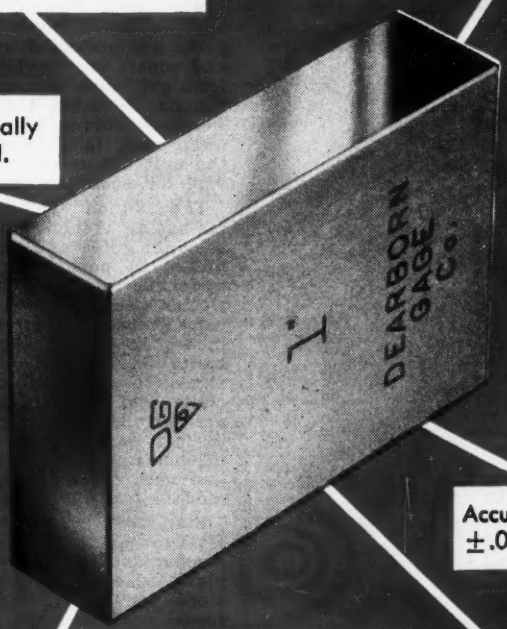
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The Ellstrom Chromium Plating process results in an extremely hard surface, giving you longer wearing qualities.

Chromium plating resists corrosion and rust.

Unconditionally guaranteed.



Accurate up to ±.000002"

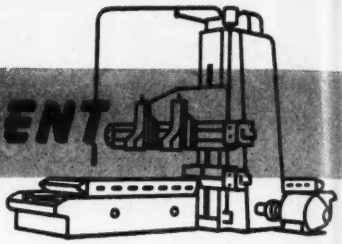
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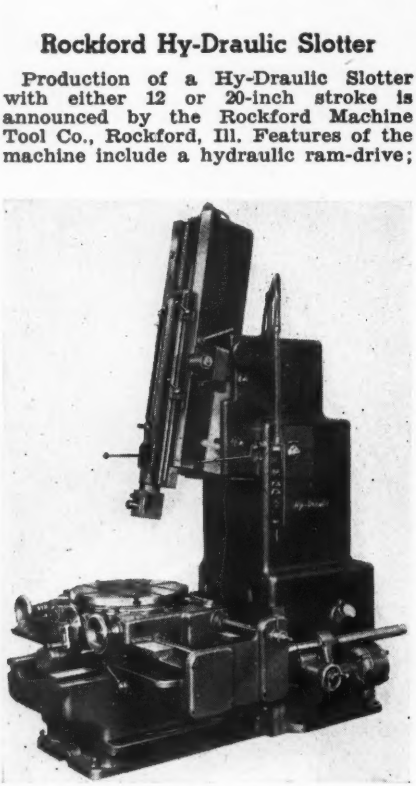
Originators of Chromium Plated Gage Blocks

NEW SHOP EQUIPMENT



Rockford Hy-Draulic Slotter

Production of a Hy-Draulic Slotter with either 12 or 20-inch stroke is announced by the Rockford Machine Tool Co., Rockford, Ill. Features of the machine include a hydraulic ram-drive; manual and hydraulic longitudinal and transverse feeds, with power rapid traverse; manual and hydraulic rotary feeds to table, with power rapid traverse; micrometer dials, graduated in thousandths of an inch, for longitudinal and transverse feeds; and table graduated through 360 degrees.



Rockford 20-Inch Stroke Hy-Draulic Slotter

Rugged construction of all units provides ample strength for continuous full-capacity operation of the machine. The design enables the operator to handle all movements of the machine easily, with control levers and push buttons conveniently located. Rotated parts are protected by suitable guards, and wipers are provided to protect ways from grit, dirt, and chips. Suitable provisions are made for compensating for wear of moving parts. The base, column, ram, table, and related parts of the unit are carefully machined to provide for accurate alignment.

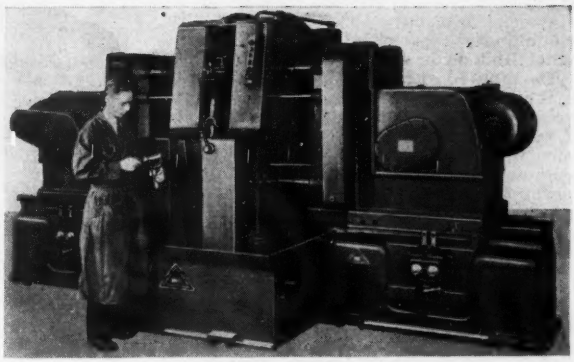
The 12-inch stroke Hy-Draulic Slotter has an 18-inch minimum space under the ram guide and an adjustment of 15 inches in positioning the ram on its hydraulic driver. The 20-inch stroke slotter has a 24-inch space under the ram guide and an adjustment of 19 inches in positioning the ram on its hydraulic driver. Both sides are designed to slot to the center of a 48-inch circle and have cutting speeds which are infinitely variable between 10 and 60 feet per minute. The return speed of each unit is 1.67 times cutting speed, and both units are designed to accommodate tools up to ⅞x2 inches.

Standard equipment of the Rockford Hy-Draulic Slotter includes a driving mechanism for rotary table, one index plate, vise, angle plate, and positive stops for longitudinal and transverse feeds.

LeMaire Special Two-Way Tunnion Type Machine

A special two-way trunnion type machine for drilling, chamfering and reaming yokes for universal joints has been built by the LeMaire Tool and Manufacturing Co., Dearborn, Mich. The machine is designed to accommodate workpieces ranging from ⅞ to 1½ inches in diameter which are reamed from two

LeMaire Special Two-Way Truunion Type Machine



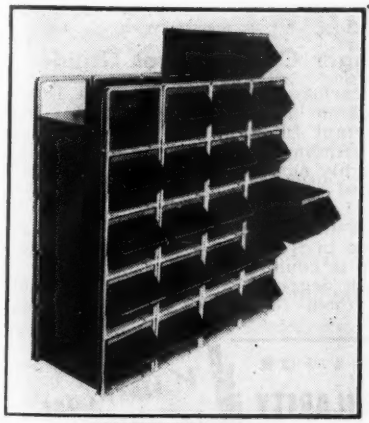
directions, thus assuring fast, accurate production.

The unit consists of a manually operated 6-station trunnion mounted on a fabricated base on which are located two standard LeMaire self-contained slide-type hydraulic units. The reamers are driven by special quill type spindles built into the trunnion, with power transmitted from the multiple head through a flexible drive. Change gears provide various spindle speeds for the 5-spindle drill heads.

At the first station of the trunnion, parts are loaded and unloaded. At the following five stations, they are spot drilled and chamfered, rough drilled, finish drilled, semi-finish reamed, and finish reamed respectively.

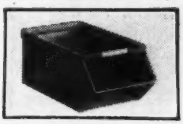
"Standard" Type R2V Variable Speed Buffing and Polishing Machine

The Standard Electrical Co., 2487 River Rd., Cincinnati 4, Ohio, announces the addition to its line of infinitely variable speed buffing and polishing machines of a unit having two separate spindles, two motors, two magnetic

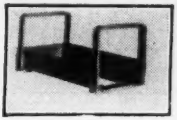


REDUCE HANDLING OF TOOLS, PARTS AND MATERIALS

Because Stackbins are portable containers—not fixtures—tools, parts and materials can be carried to departments, from machine to machine, or held in stockrooms without being transferred from one container to another. Stored in Stackracks, any Stackbin is instantly accessible when its contents are needed—without disturbing any other bin.



STACKBINS are individual hopper-fronted stacking bins, designed for storage, transportation and assembly.



STACKRACKS are individual units which lock together to form storage racks of any capacity. Stackbins slide like drawers.

STACKBINS

Manufactured and sold in Canada exclusively by Walter H. Wickware, Ottawa.

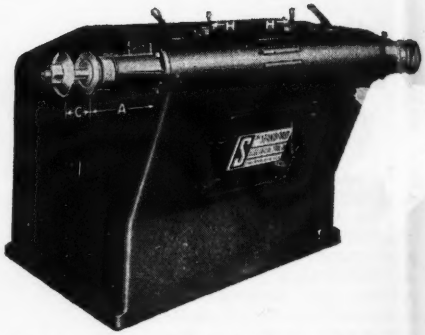
WRITE STACKBIN CORP., 53 TROY ST., PROVIDENCE, R. I.

STACKBIN SYSTEM

"Stacked and Still Accessible"

starters, two start-stop push-button stations, two hand brakes (each with coincidental switch), and two handwheel-indicator speed controls.

Designated as the Type R2V, the machine is available in 5 and 7½ h.p. sizes. Spindle speeds from 1,500 to 3,000 r.p.m. can be quickly obtained by merely turning a handwheel. Each spindle is individually operated, thus permitting each workman to be independent of the other. Spindle speeds can be properly adjusted to allow for the performance of polishing, coloring, buffing, and other operations. As



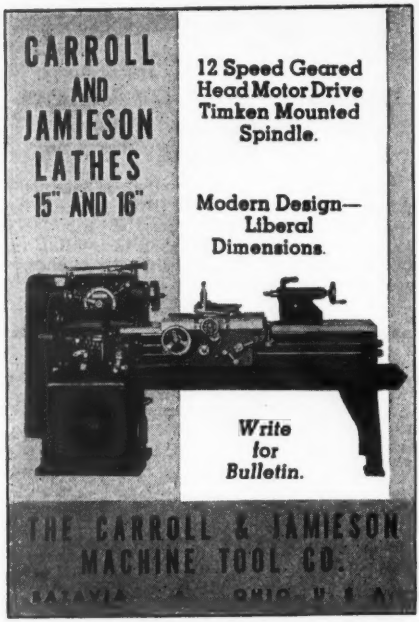
"Standard" Type R2V Variable Speed Buffing and Polishing Machine

wheels become worn, spindle speeds may be increased.

The "A" dimension of the machine measuring from the side of the base to the inside of the wheel is 11 inches, however, on special order, the unit can be obtained with a 7½ or 17-inch measurement. The standard length of the spindle is 78 inches and the height to the center of the spindle is 38 inches. The spindle overhangs the front of the base of the machine.

Hager Carbide Tool Grinder

A carbide tool grinder which is designed to speed up considerably the important function of precision carbide tool grinding and to eliminate the need of highly skilled operators has been developed by E. F. Hager and Son, 98-02 217th Lane, Queens Village, L. I., N. Y. Based on the fundamental principle employed in Swiss type grinders, the machine is constructed to grind or lap, to a high degree of precision, carbide cutting tools for lathes and screw ma-





5 GOOD REASONS FOR

famco FOOT PRESS POPULARITY

Famco Foot Presses are the inexpensive solution to light forming, stamping and punching jobs. Made in 10 models, easily operated by women or girls, they offer mass production speed without power cost. Let Famco help select the proper machine.

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FAMCO MACHINE CO.
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New! **WRITE FOR YOUR COPY TODAY**

The complete line of Ford Carbide Cutters is described and illustrated in this new 4-page bulletin. All standard styles and sizes are listed, as well as a selective few Carbide Specials which have been made to customer specifications.

Carbides enjoy the distinct advantages of faster cutting speeds, greatly increased tool life, with proportionately fewer regrinds, lower tool inventory, maximum production economy. In actual test they have been shown to outlast ordinary high speed steel by a ratio of fifty to one.

If you are interested in attaining these advantages, write for your copy today.

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HAND CUT FILES • GROUND FROM SOLID CUTTERS • CARBIDE CUTTERS

Why Bother

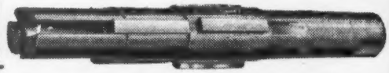
WITH A MULTITUDE OF SOLID MANDRELS ?

•

19 Nicholson *E-X-P-A-N-D-I-N-G* MANDRELS

do the work of

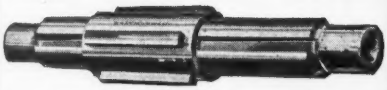
209 SOLID ARBORS



TYPE A—STEP JAW DESIGN

Especially adapted for holding work with short bores while being machined between centers on lathes, grinders, millers, shapers, etc.

Size No.	Range of Bores Taken	Length Overall
1A	½" to 1"	9"
2A	1" to 1½"	11"
3A	1½" to 2"	12¼"
4A	2" to 3"	20½"
5A	3" to 4"	21"



TYPE B—STRAIGHT JAW DESIGN

Adapted for work with both short and long bores.

Size No.	Range of Bores Taken	Length Overall
IX	½" to 21/32"	5"
2X	21/32" to 21/32"	6"
3X	21/32" to ¾"	6"
00	¾" to ⅞"	8⅛"
0	⅞" to 1"	8¼"
1	1" to 1¼"	9"
2	1¼" to 1⅝"	11¾"
3	1⅝" to 2"	13¾"
4	2" to 2½"	17¼"

(Other sizes taking up to 7" bores.)
Sold singly or in sets. Prompt delivery.
Bulletin 1043.

W. H. NICHOLSON & CO.
136 Oregon St., Wilkes-Barre, Pa.

chines as well as tool bits with carbide tips inserted in milling cutters. All angles can be accurately rough and finish ground or lapped on the diamond wheels by simple mechanical settings.

An advantage claimed for the Hager Carbide Tool Grinder is that it eliminates guesswork and free-hand operation. Once the tool is clamped in the easily adjustable vise-like toolholder



Hager Carbide Tool Grinder

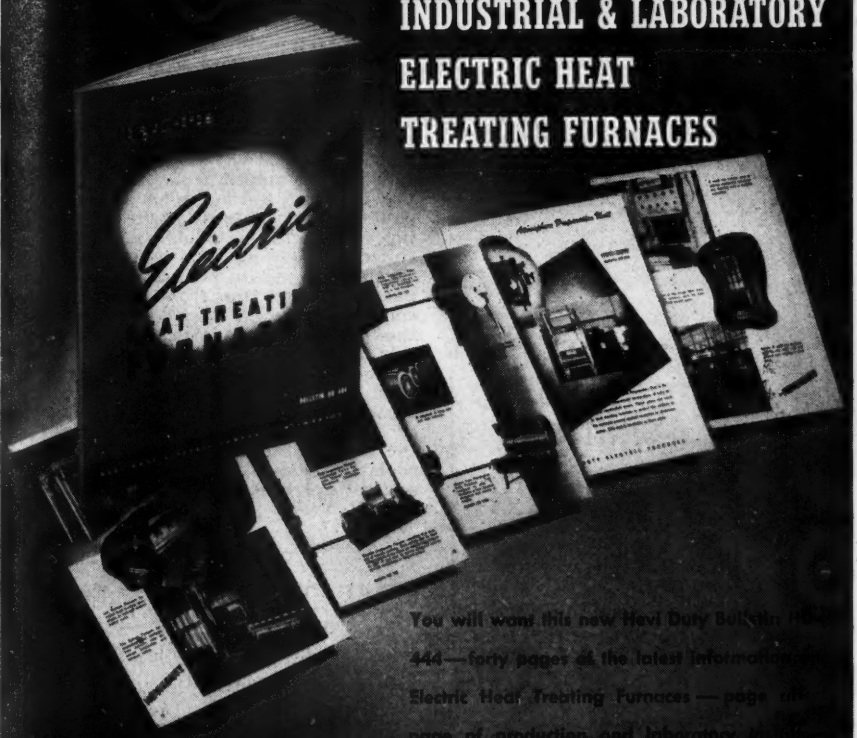
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and set by built-in protractors for the cutting edge and clearance angles, the uniform reciprocating action of the tool across the diamond wheel assures a keen edge and straight face on the tool. After the tool is locked in the desired position the toolholder can be slid from the rough grinding wheel to the finish grinding wheel without removal from the machine or changing the angular settings, thus enabling accurate finish grinding. Parallel sides are said to be easily obtained and duplicate tools can be ground and used interchangeably.

The grinding spindle is precision ground and is supported on two felt-sealed precision ball-bearings. End play

A New Bulletin

on HEVI DUTY INDUSTRIAL & LABORATORY ELECTRIC HEAT TREATING FURNACES



You will want this new Hevi Duty Bulletin No. 444—forty pages of the latest information on Electric Heat Treating Furnaces—page after page of production and laboratory installation pictures—help for planning

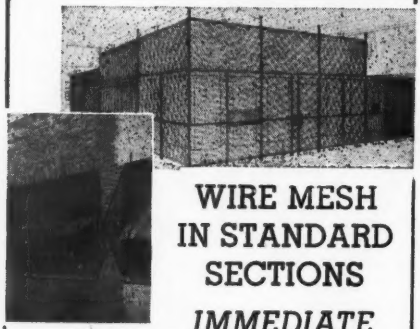
HEVI DUTY ELECTRIC COMPANY

of the grinding spindle is said to be completely eliminated by its unique design. The heavy center of the spindle and rigidly constructed cabinet prevent vibration without needless bulk. A spindle speed of 3,400 r.p.m. is attained throught a V-belt which transmits power from a ½ h.p. motor.

The toolholder is mounted on a hardened and precision ground shaft which pivots and slides axially in bronze bearings. Side movement is controlled by a micrometer adjusting unit, reading in thousandths, located on the left end of the shaft. A compression spring mounted in a cup on the other end of the shaft causes a constant thrust against the micrometer nut. Thrust ball bearings are mounted on either end of the shaft to ensure free pivoting. Pivoting motion of the shaft is controlled by an adjustable stop arm which may be adjusted roughly by releasing a lock screw and revolving the arm about the shaft. Fine adjustment is effected by means of a knurled thumbscrew. A toolholder rest bar, mounted parallel to the pivot shaft, serves as a stop for the adjustable stop arm on the left and as a stop rest for the toolholder.

Coolant is supplied in ample quantity to prevent overheating the carbide while rapidly removing the material. Chips and carbide particles are washed down into a tank. The coolant system provides for two stages of settling. Coolant is pumped from one section of the tank up a riser pipe and through shut-off cocks to any of the four grinding faces of the wheels. A splash pan collects the coolant and directs it through a drain channel, where it passes through the front section of the coolant tank. A large percentage of the grit particles settles to bottom of this first section. An overflow to the second compartment affords foreign matter another chance to settle. Separate drain plugs facilitate the cleaning of sediment from each compartment of the coolant tank. A relief valve in the coolant system protects the pump against overheating when shut-off cocks are all closed.

TOOL CRIBS



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WINDOW GUARDS WIRE MESH

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ACME WIRE & IRON WORKS

CANFIELD & MORAN STS., DETROIT 7, MICH.

THIS IS OUR FORTY-SIXTH YEAR

AAF "Electro-Mist" Collector

The American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky., announces the addition to its electronic line of air filtration equipment of a

S & S HINGES

VARIOUS WIDTHS and GAUGES



BUTTS AND CONTINUOUS LENGTHS

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For GUARDS CABINETS CASES BOXES

S & S MACHINE WORKS

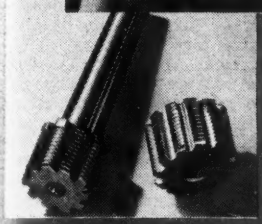
4533 W. LAKE STREET HARDWARE DIVISION CHICAGO, 24, ILLINOIS

Do it with DALZEN



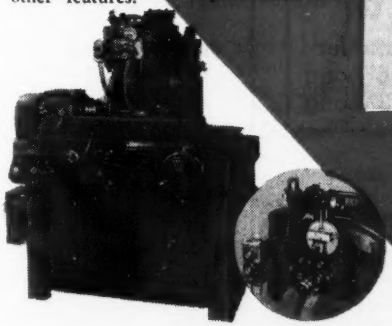
Dalzen manufactures an extensive line of precision cutting tools, parts, thread grinding and special machines—engineered for maximum efficiency and economical operation. Each is the result of years of experience on the part of designers and craftsmen. These are reasons why, all over the United States and in many foreign countries, master mechanics who have used and worked with Dalzen-made machines and tools say, "You can do it better with Dalzen." Write for details on how Dalzen can "do it better" for you.

Left: Dalzen taps, U. S., Metric, Whitworth, and Special forms are precision ground of hardened high speed steel or tungsten carbide.

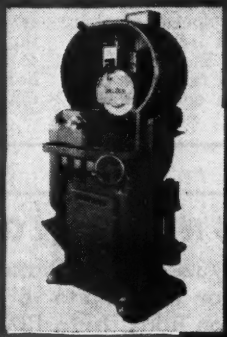


Left: High speed ground thread milling cutters, scientifically heat treated for longer life.

Below: No. 5 *Electronic* Thread Grinder. High production efficiency and accuracy by controlled wheel speed, other features.



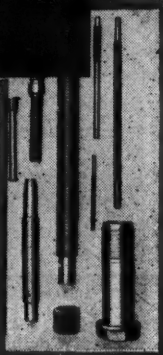
Right: No. 2 Thread Grinder. Compact, upright design saves floor space. Simple to operate. Low first and maintenance cost. Ideal for short or production runs.



Below: Dalzen "2-in-1" combines a dependable accurate centerless lapping machine with a sturdy drill press.



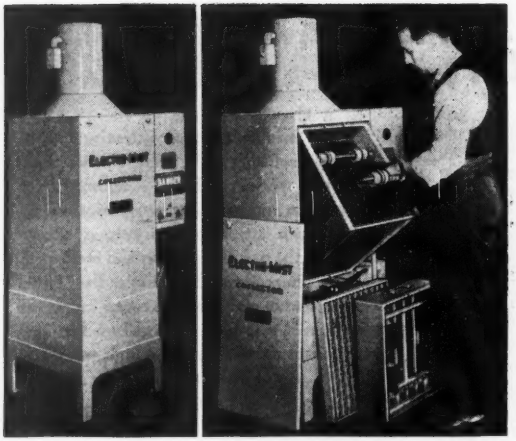
Right: Parts are thread ground exactly to your specifications. Rigid inspection assures a uniform fine finish. Threads also cut or rolled.



DALZEN

TOOL AND MANUFACTURING CO.

12255 EAST EIGHT MILE ROAD • DETROIT 5, MICH.



AAF "Electro-Mist" Collector

self-contained completely demountable electronic unit which is designed to collect oil mist from high-speed cutting tools or welding fumes in light concentrations. Known as the "Electro-Mist," the unit includes an axial flow fan that is mounted on top of the collector and draws air from the operation, which is properly hooded, through piping or flexible tubing into the base of the unit.

In the application of the collector to cutting operations, the mist-laden air first passes through a permanent unit filter in order to remove any metallic dust or large drops of oil and then enters an ionizer in which the mist and smoke particles receive an electrical charge before passing into the collector unit, where they are precipitated on plates. The collected oil mist accumulates and drips off the lower edges of the plates, through the filter, and into a reservoir below. According to the manufacturer, as many as two or three gallons of oil can be salvaged daily and may be piped back into the machine tool or drained off as preferred.

ROD GRINDING

Straight Rods 1/32" to 1/2" Diameter
Diam. Tol. .0005 on Rods Up to 6' Long
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13 YEARS OF

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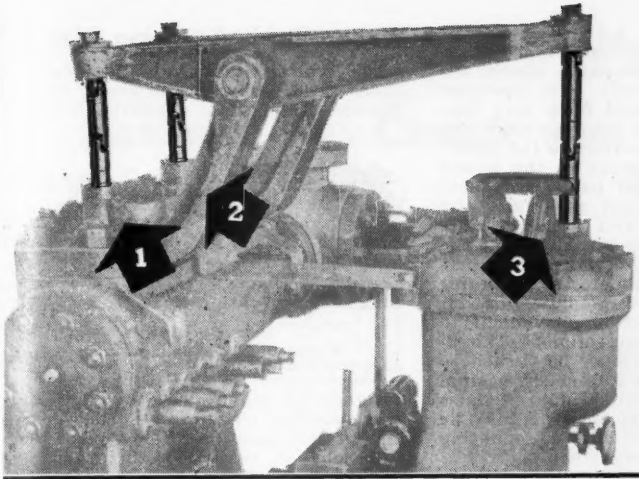
SMALL PRECISION PINS MADE TO CUSTOMER'S BLUE PRINTS
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Double Jointed *Joints*

PROVIDE POSITIVE AND FLEXIBLE ACTION FOR THIS STEAM TURBINE VALVE CONTROL MECHANISM

Both Curtis single and double Universal Joints are used here in an unique assembly.
1 and **2** — Show Curtis Double Joints used on the yoke end of rocker arm.
3 — Shows two Curtis Standard Single Joints assembled as a double joint.
This is just one of many special applications where Curtis Joints, either single or double, or in combination, have met and overcome difficult requirements.
Again Curtis "Standards" of quality and long life have been selected to give trouble-free operation with minimum maintenance.
When you encounter such difficult problems in your planning — let Curtis Engineers work with you.
Every Universal Joint made to Curtis "Standards" is stamped with our Registered Trademark.

Write for technical data and useful Engineering Templates.

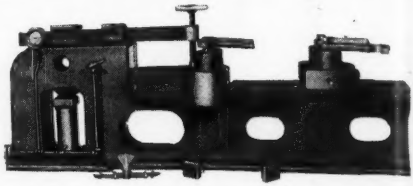
CURTIS UNIVERSAL JOINT CO. INC.
SPRINGFIELD, MASS. • • • SOLE DISTRIBUTORS, BOSTON GEAR WORKS, NO. QUINCY, MASS.

A feature of the AAF Electro-Mist Collector is a removable panel that affords access to all parts which are removable without tools. The operator is said to be protected from any possibility of electrical shock, since by turning the latches to remove the panel, he shuts off the current to the power pack and all charged parts are short circuited to remove any residual static charge. The filter and ionizing units can be slid out of the casing and the collector unit tilted forward, thus permitting the removal of the collector plate assemblies for washing or inspection at any location convenient to water and sewer connections. The 7-inch diameter intake may be turned so as to enter from any side of the casing, and the floor support, which provides space for draining the oil pan, may be omitted with overhead or wall mounting arrangement provided instead.

The AAF Electro-Mist Collector measures 28¾x20¾x70 inches high. The power pack is designed for operation from nominal 115 volts, 60 cycle single phase current. On multiple installations, one large power pack is said to furnish sufficient current for as many as ten Electro-Mist Collectors.

Walter Stock Adjusting Machine

The Walter Stock Adjusting Machine illustrated herewith, product of the Watson-Stillman Co., Roselle, N. J., is

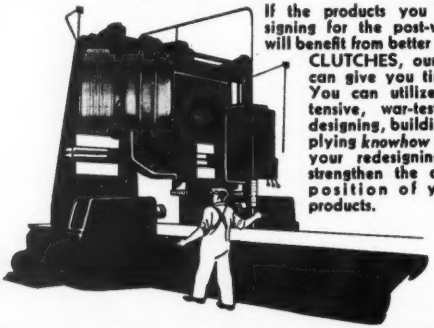


Walter Stock Adjusting Machine

designed for lengthening, straightening, or shortening locomotive parts. According to the manufacturer, some 36 repair jobs on various parts of running and valve-motion gears of locomotives can be performed quickly and accurately on the machine.

Ruggedly constructed of steel throughout, the Walter Stock Adjusting Machine consists of a frame, two toggle links, ram, filler block, sliding block, four eccentric gripping cams, clamping

CLUTCH *Knowhow* That Will Simplify Your Redesigning



If the products you are redesigning for the post-war market will benefit from better conforming CLUTCHES, our engineers can give you timely help. You can utilize their extensive, war-tested clutch designing, building and applying *knowhow* to simplify your redesigning and to strengthen the competitive position of your new products.

SEND FOR THIS HANDY BULLETIN ON POWER TRANSMISSION



It shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications. Every production engineer will find help in this handy bulletin, when planning postwar products.

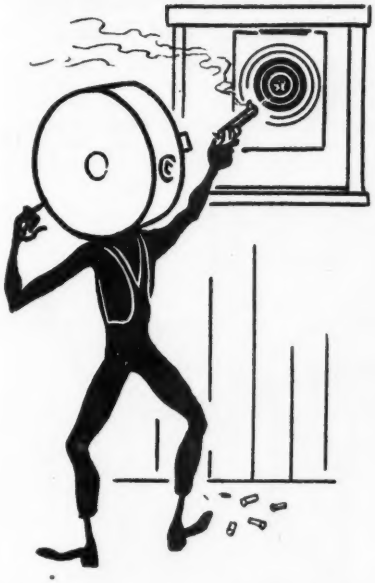
PULLMORE CLUTCHES

ROCKFORD CLUTCH DIVISION
[Formerly Known as Drilling Machine]
Borg-Warner Corporation
300 Catherine Street Rockford, Ill



TEST A WESTCOTT

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Accuracy is *engineered* into Westcotts. For example, the Westcott Universal centers to .003" or less, total indicator reading, when new. Special alloy scrolls and other sturdy precision parts insure a high degree of accuracy for the active life of the chuck. Accuracy means faster production, fewer rejects. That's why we say—TEST A WESTCOTT.

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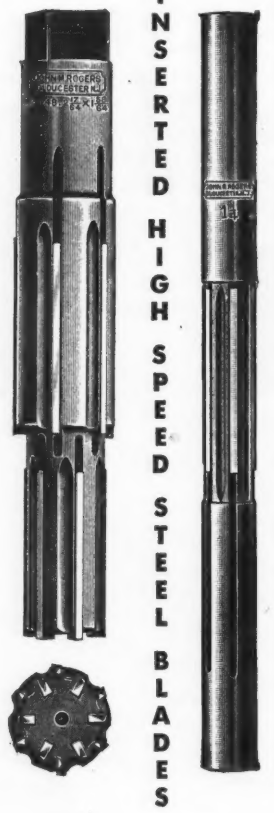
ROGERS REAMERS

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ADJUSTABLE FOR WEAR

INSERTED HIGH SPEED STEEL BLADES

CARBIDE TIPS OPTIONAL



Align and concentric down to 5/8" diameter.

QUICK DELIVERY!

JOHN M. ROGERS TOOL CORP.

GLOUCESTER CITY **NEW JERSEY**

bar with wheel and screw, wedge block and two binding links. Three types of power equipment may be furnished with the machine; namely, a hand pump, accumulator, or motor-driven pump.

Lepel Process for Hardening of Shafting and Tubing

Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York 23, N. Y., announces a process for the continuous surface hardening of shafting and tubing of any length. The process involves the use of heating and

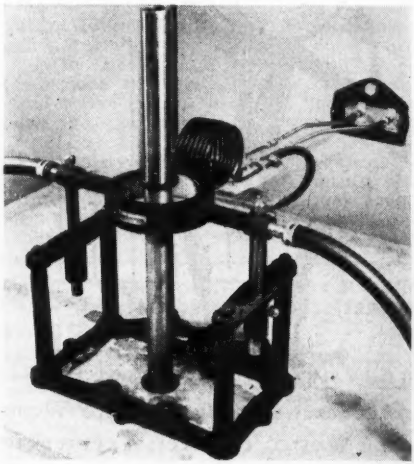


Illustration showing the manner in which shafting or tubing can be continuously surface hardened using Lepel induction heating equipment

quench coils through which the shaft or tube is moved at a predetermined speed and rotated slowly to provide for uniform surface hardening. Due to the high frequencies developed by the Lepel spark-gap operated equipment (100,000 to 450,000 cycles), heating is so rapid and the time at heat so short that grain growth is said to be prevented from taking place. The process is claimed to develop a super-hard skin with unusual wearing qualities.

The speed of heating and short time of heat are also said to prevent surface decarburization and scaling. Ground shafting or tubing may, it is claimed,

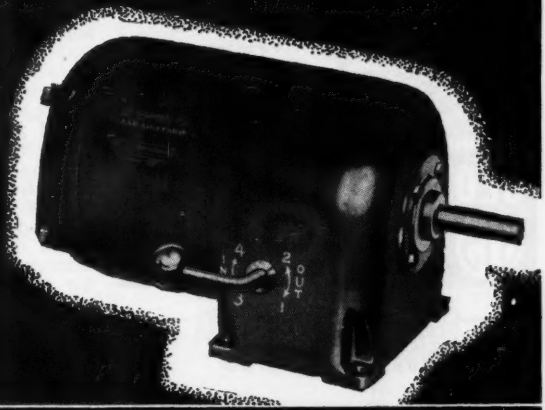
Rarin' to Go!

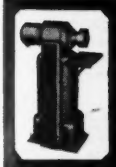


Yes LIMA's New

½ and ¾ hp Selective 4 Speed Gearshift Drive is ready.

This new LIMA unit is designed to power machine tools and equipment requiring less than 1 hp. Other larger size Gearshift Drives for all types of machine tools 1 to 20 hp.





THE LIMA ELECTRIC MOTOR CO.

112 FINDLAY ROAD

LIMA, OHIO

REPRESENTATION IN MOST PRINCIPAL CITIES

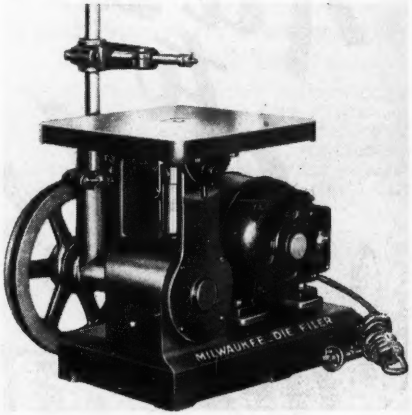
LIMA GEARSHIFT DRIVES - LIMA ELECTRIC MOTORS
LIMA MAGNETIC POLISHING LATHES - LIMA PEDESTAL GRINDERS



be hardened without the need for finishing after quenching. Furthermore, due to the short heating cycle, core structure is said to be unchanged and maximum ductility maintained. The depth of hardness can be readily controlled by adjusting the input power or varying the travel speed of the part through the heating and quenching coils. Shafting or tubing up to 3 inches in diameter or any hardenable steel can be successfully heat treated with a standard 30 kw. Lepel induction heating unit with normal current input, it is claimed.

Milwaukee Die Filer

A versatile bench-type reciprocal filing machine designed primarily for use in tool, die, and machine shops in per-



Milwaukee Die Filer

forming a variety of filing, sawing, and lapping operations is now being marketed by the Milwaukee Chaplet & Manufacturing Co., Milwaukee, Wis. The machine can also be used in foundries and metal-working plants for the fast precision trimming of small castings, stampings, forgings, and other metal parts.

The file support unit or saw overarm may be swung out of the way instantly, thus enabling the operator to remove the die block quickly for frequent checking and to return it immediately to the exact original setting. The saw overarm, which may be readily substituted for the lower file-support arm, is pro-

CLEAR-CONCISE NAMEPLATE MARKING

EASILY— QUICKLY!



MODEL No. 4

The nameplate on your product is your signature; keep it neat and legible! Accurate location and alignment are assured with this NAMEPLATE DETAIL PRESS. Write for particulars.

- Simple Operation
- Perfect Alignment
- Uniform Depth

Designed & built by

GEO. T. SCHMIDT, INC.
1806 W. BELLE PLAINE AVE.
CHICAGO • 13 • ILLINOIS



CHAMPION

EXPANDING MANDRELS

Any size hole within a 1" range of infinite variation! That's what one size Champion Expanding Mandrel will completely and accurately handle. The hardened steel flexible sleeve automatically expands to the correct size as it is raised on the tapered arbor. Only 12 champions needed for range from ½" to 6½". Eliminates numerous solid mandrel sizes. More convenient. Proved for years by thousands of shops.

COSTS ⅔ LESS

The WESTERN Tool and Manufacturing Co.
SPRINGFIELD, OHIO



Making fine, Fractional Horsepower Gears *to the most exacting specifications* is a highly developed specialty of ours. So well known is the unusual skill and accuracy of GS craftsmen, in working to extreme tolerances that, long since, we've become the "world's largest exclusive manufacturers of Fractional Horsepower Gears"! Should your post-war plans include products in which better small gears are involved, by all means submit your problem to our staff of long experienced engineers.

GEAR Specialties

Spurs • Spirals • Helicals • Bevels • Internals • Worm Gearing • Racks • Thread Grinding

2635 WEST MEDILL AVENUE • CHICAGO 47, ILLINOIS

WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS

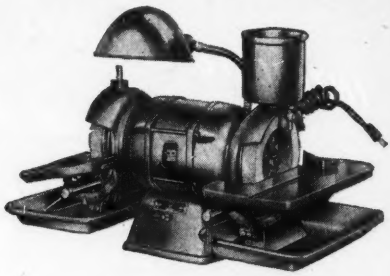
vided with hold-down fingers and is designed to permit the performance of extremely accurate work. To perform lapping operations, lapping sticks may be substituted for files or saws through the use of a simply constructed holder which is inserted into the chuck jaw.

The standard design of the Milwaukee Die Filer includes a table which may be tilted 12 degrees in two directions; 110-volt 60-cycle a.c. motor; file roller support; and saw overarm. It can, however, be obtained without the saw overarm or motor if desired.

Baldor Series 500 Carbide Tool Grinder

Development of improved carbide tool grinder designated as the Series 500 is announced by the Baldor Electric Co., 4351 Duncan Ave., St. Louis 10, Mo. The unit is powered by a ½-h.p. 3,400 r.p.m., precision built, heavy duty ball bearing motor which is reversible so that either right or left-hand tools may be sharpened. The heavy motor shaft is mounted on large ball bearings which are said to require no lubrication.

The 12x6-inch tool tables of the Baldor Series 500 Grinder can be easily adjusted up to angles of 45 degrees by merely unloosening screw clamps. Grinding



Baldor Series 500 Carbide Tool Grinder

wheels can be readily replaced since each table is adjustable to compensate for wheel wear.

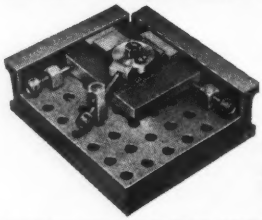
The Baldor Series 500 Carbide Tool Grinder is equipped with a large water pan at each end and with a water pot having a spout for moistening either wheel. The machine is supplied complete with a protractor type tool support for adjusting the tip angle of the tool

PRECISION ACCURACY

with **DAYTON ROGERS**

HOLOCATOR

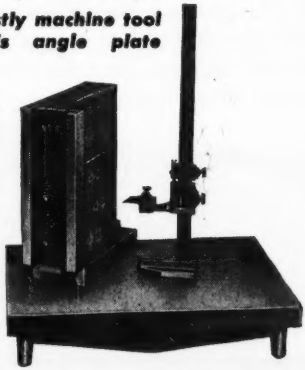
(HOLE LOCATOR)



You can eliminate costly machine tool equipment with this angle plate "HOLOCATOR."

ABOUT 75% OF THE WORK THAT HAS TO BE PERFORMED ON A JIG BORING MACHINE CAN BE TAKEN CARE OF ON THIS PRECISION DEVICE.

All precision drilling such as locating drilled or reamed holes, as well as laying out of dies and drill jigs, can be performed on an ordinary drill press.



Write for illustrated bulletin No. 108-12.

DAYTON ROGERS MANUFACTURING CO.

2835 12th Ave. So. Minneapolis 7, Minn.

CUT HOLES, DISCS, GASKETS, ETC.,

WITH

RIEGER CIRCLE CUTTERS



Sometimes the hole is wanted, sometimes the disc which comes out of the hole. It's all the same to the Rieger Circle Cutter.

You can use this handy tool for making circular cuts of 2" to 8" diameter in sheet metal, wood, fibre, rubber, composition, or plastic. Circle cutters have been ordered by many manufacturers of radios, ranges, refrigerators, airplanes, automobiles, furniture, etc.

The cutters are also popular in general machine shops for cutting holes in sheet materials and for making gaskets. In the latter case, arms with two bit holders are frequently furnished.

The Circle Cutter is made in two standard models. One has a No. 2 M.T. shank as illustrated. The other has a ½" straight shank. Either model complete with Pilot Drill and Bit, $18.00. Special models will be made to order.

Mail coupon or write for complete data on Circle Cutters and other Rieger tools.

REPRESENTATIVES

Harry E. Hummer, 115 Montclair Ave., Newark, N. J.; Jack Brewer, 1151 S. Broadway, Los Angeles 15, Calif.; Schellenbach Machine & Tool Co., 480 Fifth St., San Francisco 7, Calif.; Bridge Machinery Co., 768 St. Paul St., W., Montreal, Quebec.

THE RIEGER MFG. CO.
Dept. MMS-7, Miamisburg, Ohio.
Send complete information on Circle Cutters, Multifacers, Spindle Stops, and Die Holders.

NAME

COMPANY

STREET ADDRESS

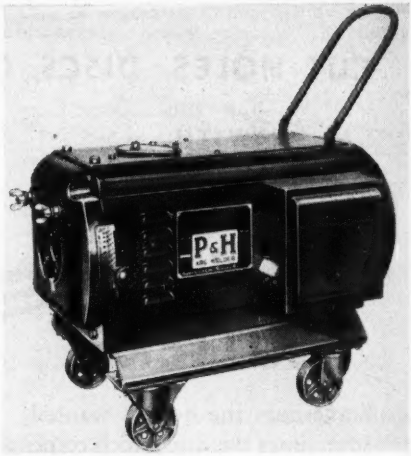
CITY AND STATE

being ground. The wheel flanges are designed to accommodate steel-backed wheels, either silicon carbide types for carbide tools or aluminous oxide types for high speed steel tools. In addition, each flange is provided with tapped holes for mounting diamond wheels.

P&H Model WA-300 Square Frame Welder

In response to demands for a larger capacity square frame welder, the Harnischfeger Corp., Welding Division, Milwaukee 14, Wis., has introduced the P&H Model WA-300 Square Frame Welder illustrated herewith, which has a W.S.R. (Welding Service Range) rating of from 60 to 375 amperes. Retaining the simple, compact design of previously announced smaller square frame welders, the large model also retains the two-part construction, single heat control, visual current calibration, and adaptability to parallel operation where unusually high amperage is desired.

New features claimed for the P&H Model WA-300 Square Frame Welder include weatherproof construction, polarity reversing switch, and removable stator, plus overload protection both for contacts and the new low-voltage magnetic starter.



P&H Model WA-300 Square Frame Welder

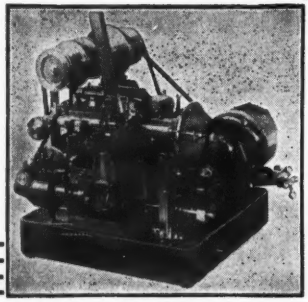
WALTHAM

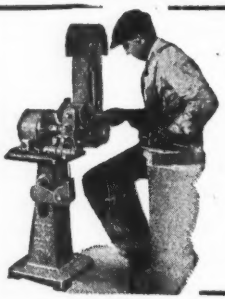
Pinion and Gear Cutting Machines

with revolving cutter will make 2 or 3 successive cuts for watch pinions or may be used for fine pitch gears up to 1½" dia. Revolving cutter makes successive cuts on blanks held and indexed by work spindle and usually supported by a tail center. Only straight teeth can be cut. *Write for Bulletin No. 112.*

WALTHAM MACHINE WORKS

WALTHAM **MASS.**





"PRODUCTION" TYPE S

Centerless

SURFACER • POLISHER • BUFFER

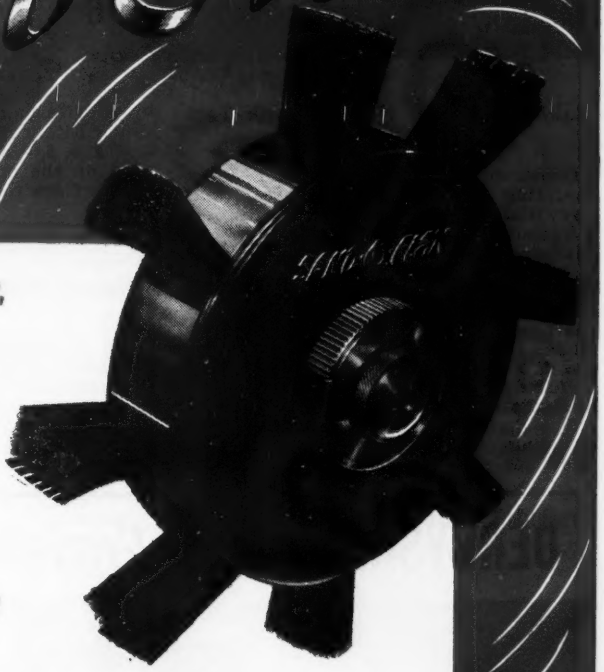
This versatile machine combines a centerless feed polishing machine with a vertical or horizontal belt grinder, surfacer, polisher or buffer. Ideal for cylindrical polishing or straight line finishing on flat work. Can be used for anything that can be ground or polished—metals, rubber, fibre, wood, etc.

Write for Illustrated Folder

PRODUCTION MACHINE CO. • **GREENFIELD, MASS.**

THE NEW

SAND-O-FLEX

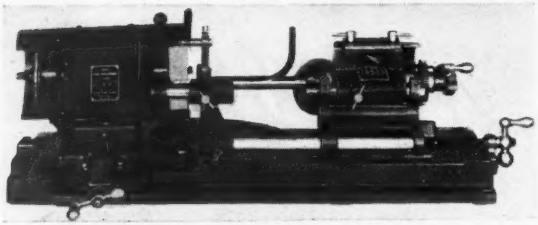


DEBURRS, SANDS, FINISHES ALL MATERIALS—QUICKLY, ECONOMICALLY, REGARDLESS OF CONTOUR

The Sand-O-Flex is a compact (outside diameter 8"), lightweight (2¾ lbs.), quickly-loaded (1 minute maximum) sanding wheel that deburrs, sands, finishes any material—wood, metal, plastic, rubber, special products—equally well. Particularly effective on irregular surfaces and hard-to-get-at places. Fits any ½" or ⅜" stationary or flexible motor shaft and operates effectively on portable electric tools. A wide range of abrasives of various grits and grades are supplied for use with the Sand-O-Flex. For additional information write or wire.

SAND-O-FLEX CORPORATION

4373 Melrose Avenue • Hollywood 27, California



Blake Model No. 2 Tap Grinder Equipped with Bent and Hook Shank Tap Grinding Attachment

Blake Bent and Hook Shank Tap Grinding Attachment

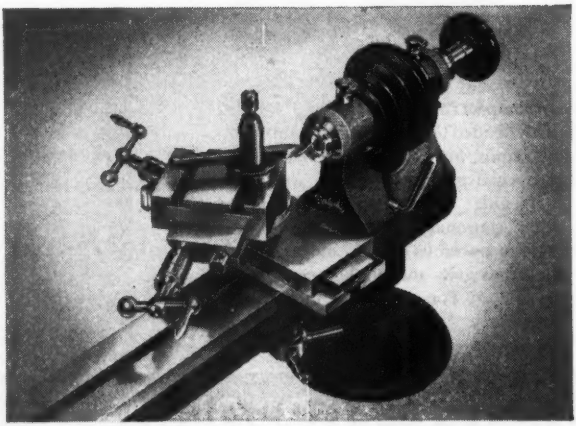
Constructed for quick and easy mounting on, as well as removal from, any Blake Model No. 2 tap grinder, a grinding attachment for use in sharpening bent and hook shank taps is announced by the Edward Blake Co., 634 Commonwealth Ave., Newton Center 59, Mass. To allow for accurate sharpening of taps, the attachment includes a center to support the front of the tap and a short grip collet which is fitted on the shank immediately behind the threads.

The Blake Bent and Hook Shank Tap Grinding Attachment is designed to allow for grinding the chamfer on any bent shank tap up to ½ inch-13 threads used on ⅛, 5/32, ¼, ⅜, or ½-inch automatic tappers, and any hook shank tap up to 5/16 inch-18 threads used on ¼, ⅜, or ½-inch precision tappers as made by the National Machinery Co., Tiffin, Ohio. Either right or left-hand taps with 2, 3, 4, 5, 6, 8 or 10 flutes may be sharpened on the chamfer with any amount of relief desired.

Watson-Stillman Angle Molding Press

For molding plastic products requiring split molds and for molding complicated parts by the transfer method, the Watson-Stillman Co., Roselle, N. J., has brought out an angle molding press, an outstanding feature of which is a design that provides for the elimination of

DERBYSHIRE *Fine Precision* LATHES



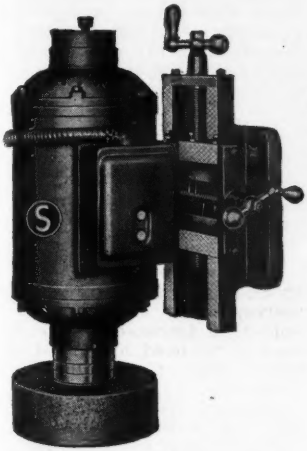
CHUCKS

Attachments

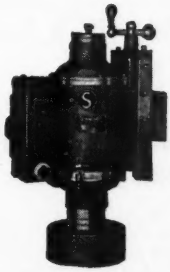
Illustrated

DERBYSHIRE
TWO-SLIDED
SLIDE REST
on
MAGNUS
LATHE

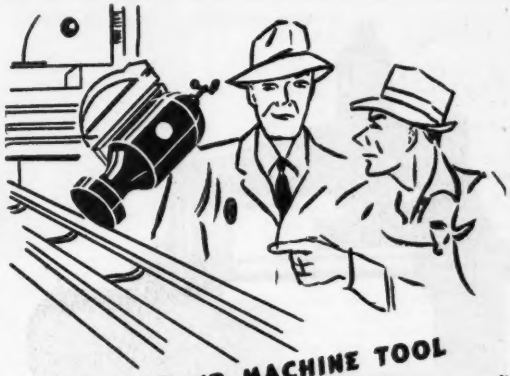
F. W. DERBYSHIRE, INC., WALTHAM 54, MASSACHUSETTS



Grinder with Vertical and Horizontal feeds. Available with or without feeds, as preferred.



Grinder with vertical feed and special mounting pad. All models have integral mounting pad for rigidity.



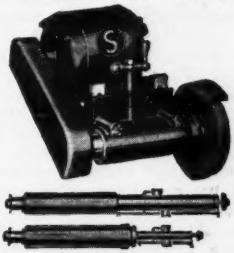
"RIGHT! YOUR MACHINE TOOL CAN NOW SERVE YOU AS A (STANDARD) GRINDER TOO."

YES SIR! You can now make your machine a "double purpose" machine, the "Standard Way." Standard Vertical Spindle Grinders and Standard Internal-External Grinders can be easily mounted on your Planers, Boring Mills, Shapers, Milling Machines, etc., giving you added profits!

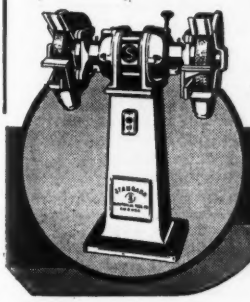
VERTICAL SPINDLE GRINDERS: Sizes range from: ½ H.P. to 15 H. P. for straight or cup wheels up to 18" diameter. Also for cylinder wheels, or segmental wheel chucks. Speeds: 1200, 1800, and 3600 R.P.M.

Write for Your copy of Catalog 43, today.

Internal-External Grinders



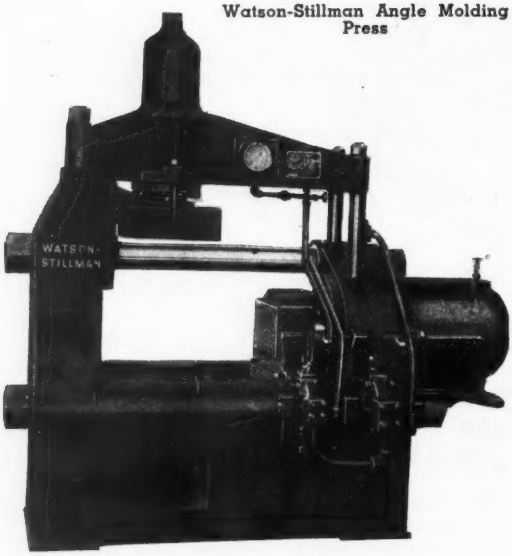
A 2-in-1 precision Tool. You can grind externally, and in a few minutes mount an interchangeable quill for internal grinding up to 24" deep. Sizes: ¼ H.P. 4" Wheel to 10 H.P. for 20" Wheel.



The STANDARD ELECTRICAL TOOL Co.

CINCINNATI · 4 · OHIO

2487 RIVER ROAD



Watson-Stillman Angle Molding Press

manual handling of split mold sections, thus reducing maintenance costs of such molds and greatly increasing production rates.

Available in two sizes measuring approximately 8 feet 6 inches high by 2 feet 4 inches wide by 8 feet 8¼ inches long and approximately 10 feet high by 2 feet 7 inches wide by 9 feet 10½ inches long, the Watson-Stillman Angle Molding Press is of all-steel construction except for the rams which are of close-grained cast iron. The self-contained radial piston pumping unit, powered by a fully-enclosed motor, can be placed on the floor in any desired location. Automatic, single-cycle operation from a push-button control panel can be obtained for the machine if desired. This system incorporates all adjustments for operation of the machine through a predetermined automatic cycle.

Allis-Chalmers Screw-Type Electrode Holder

A screw-type electrode holder one-third lighter than the corresponding size clamp-type holder, to decrease fatigue, has been announced by Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin.

Exposed metal surfaces of the new electrode holder are constructed of spatter-resistant Mallory metal. Simplified design facilitates easy replacement of parts, and heavy insulation and adequate handle ventilation provide cool operation. The holder is available in light and heavy duty sizes to accommodate electrodes up to ⅜-inch diameter.

"Lincolnweld" Automatic Shielded Arc Welding Process

An automatic shielded arc welding process to be known as the "Lincolnweld" is announced by The Lincoln Electric Co., Cleveland 1, Ohio. The process is said to be practical for the welding of machinery bases and beds, motor and generator frames, ventilating fans, tanks and pressure vessels of all kinds, landing

YOU KNOW the requirements of a good dead-center lubricant. Our compound, accidently discovered in our work, fulfills these requirements better than anything now in use. We have obtained such remarkable results with this lubricant that we are placing it on the market not as just another lubricant, but a necessity for high speed operation. An order placed now will prove this to you.

$1.00 PER ½ LB. JAR PREPAID

Please send us_____jars. Enclosed is $_____in payment.

PLASTIC LABORATORIES, INC., BOX 115 CLEVELAND 21, OHIO

Your money refunded if not completely satisfied.



TO THE *GEAR USERS* OF AMERICA

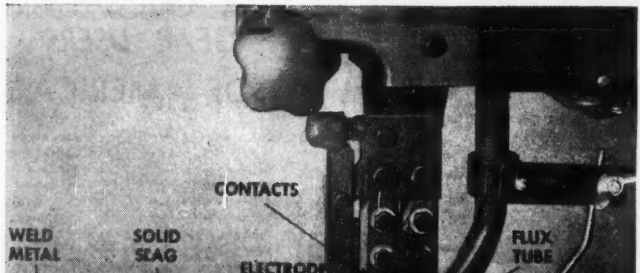
Little enough credit has been given the GEAR MAKERS of America for their outstanding contribution to the Gear Industry. Without the consistent, refined accuracy in todays gear construction, "pin-point bombing", "maneuverability", "rapid acceleration", and other overworked trade expressions would still be words instead of actualities.

Achieving this consistent precision requires a constant vigilance over production operations and many leading gear manufacturers have designated Vinco Dual Purpose Gear Rolling Inspection Fixtures—coordinated with Vinco Master Gears, as an essential to successful inspection control. The dual purpose fixture, as the name implies, has the important advantage of checking both the run-out and backlash of the part gear with one Vinco master gear; a Vinco feature that saves time, cuts operating costs and increases production. For a more detailed description write for BULLETIN NO. 91.

MILLIONTHS OF AN INCH FOR SALE BY VINCO

VINCO CORPORATION, 8861 SCHAEFER HIGHWAY, DETROIT 27, MICHIGAN. SALES OFFICES, NEW YORK, CHICAGO, CLEVELAND

Semi-Automatic Hydraulic Spline and Gear Grinder • Optical Master Inspection Dividing Head • Involute Checker • Angle Tangent to Radius Dresser • Index Plates • Precision Vises • Sine Bars • Straight-side Spline, Serration Spline, Involute Spline and Helical Spline Plug and Ring Gages • Thread Plugs, Rings and Setting Plug Gages • Spur and Helical Master Gears • Munition Gages • Propeller Hub Gages • Built-up and Special Gages • Gear Rolling Fixtures • Spline and Index Fixtures • Hydraulic Power, Control, Utilization and Distribution Units • Engineering, Design and Development



Cutaway views of a butt weld showing the elements of "Lincolnweld" operation

craft, and many parts used in the prefabrication of ships, railroad cars, and so on.

Applicable to the welding of all types of joints including butt, lap, tee, and fillet as well as corner joints, the process is designed for use with direct current, utilizing a bare metallic electrode which is fed through a granular flux deposited on the joint to be welded, deep enough to cover the completed weld. The welding electrode is power fed into the blanket of flux, its rate of feed controlled automatically for proper arc length. The direct current, supplied by a Lincoln welder, produces the arc between the electrode and the joint. The resultant arc heat fuses the electrode and parent metal, producing the weld.

Flux adjacent to the arc melts, floats on the surface of the molten metal, and then solidifies as a slag on top of the weld. Since the arc and molten metal

A. I. S. I. HY-TEN S. A. E.
N. E.

ALLOY STEELS FOR VICTORY

Scientifically selected to conserve critical alloys and meet the requirements of the AIRCRAFT, ORDNANCE, and MACHINE TOOL industries.

Complete "EARMARKED" stocks of Aircraft alloy steels at Buffalo and Detroit.

WHEELOCK, LOVEJOY & CO., INC.

138 Sidney Street, Cambridge 39, Mass.

Cleveland 14, Chicago 23, Newark 5, Detroit 3, Buffalo 10, Cincinnati 32

The SCHERR DIAL TEST INDICATOR

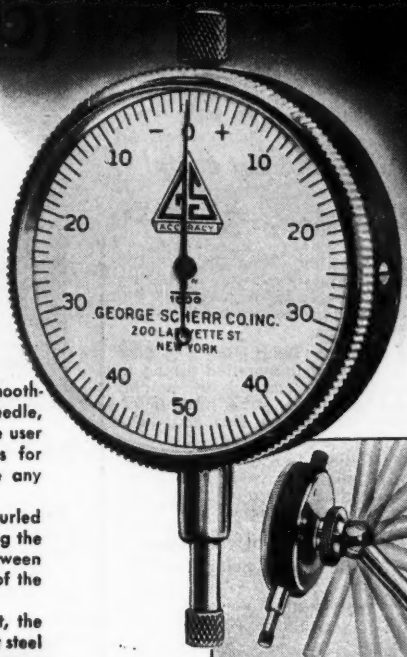
Only THREE MOVING PARTS, *insuring positive, constant accuracy*

One short rack, two gear segments and a pinion — that's all there is (outside of some fine engineering) within the dustproof case of the Scherr dial test indicator. Gear teeth are beautifully cut, with the precision of finest watch mechanism. They operate with absolutely no backlash, and with delicate, uniform smoothness throughout the entire travel of the needle, to provide most sensitive measuring. As one user remarked, "We've used Scherr indicators for years, and never had one stick, nor give any trouble."

The full universal ball joint back with knurled locking nut, permits of adjusting and locking the indicator in any position. Universal joint between the two holding arms enables the placing of the indicator where desired.

Now available as an added attachment, the magnetized base which will grip on any flat steel or iron surface, making clamping unnecessary.

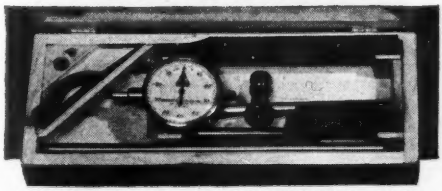
Here is a precision aid adapted to an immense diversity of production applications, in every detail up to the Scherr high standard of workmanship. Price (indicator only), $12.00. Further details on request. Order today for quick delivery.



FULL UNIVERSAL BALL JOINT permits supporting arm to be adjusted and locked at any angle.



MAGNETIZED BASE ATTACHMENT holds indicator firmly in position, on any flat steel or iron surface. Price $8.50



COMPLETE SET, IN HARDWOOD CASE with indicator clamp, toolpost holder, internal measuring attachment, three contact points, reads to 1/1000", $18.00

GEO. SCHERR CO., Inc. 198-A LAFAYETTE STREET NEW YORK 12, N. Y.

In War, as in Peace...

CERRO ALLOYS

Save time and cut costs!

CERROMATRIX (Melting Temp. 250° F.) For securing punch and die parts, anchoring machine parts without expensive drive fits, short run forming dies and other metal-working applications.

CERROBEND (Melting Temp. 158° F.) Used as a filler in bending thin-walled tubing to small radii. Easily removed in boiling water. Also used for aircraft assembly jigs, templates for forming dies and other purposes.

CERROSAFE (Melting Temp. 190° F.) Used to accurately proof-cast cavities such as molds, gun chambers, forging dies, etc., and many similar applications.

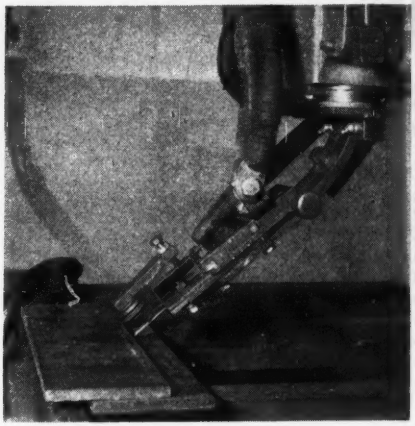
REPRESENTATIVES AND DISTRIBUTORS

Brooklyn, N. Y., Belmont Smelting and Refining Works
Ansonia, Conn., Jackson Associates
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Philadelphia, Pa., Castaloy Metal Sales Co.
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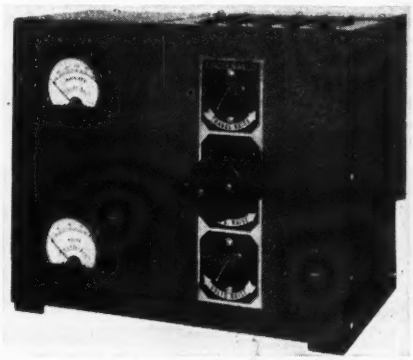
are blanketed by flux at all times, the weld metal is said to be completely protected from contact with the air, thus



"Lincolnweld" adapted for welding of horizontal lap welds

assuring maximum quality of welds and making possible the use of extremely high amperage for fast welding.

Moreover, because the Lincolnweld arc is confined within the blanket of flux,



"Lincolnweld" control box which contains all of the control equipment, including rehostats for adjustments of travel speed, welding amperage, and arc voltage

spatter is nil, thereby elminating the expense of weld cleaning. Since the operation is devoid of arc rays and smoke,

At right, two of the bench type Sunnen Precision Honing Machines used in gauge manufacturing at C. G. Conn Ltd. *Below,* checking a valve casing on one of the famous Conn instruments.





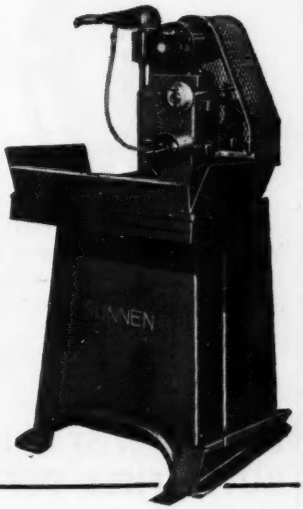
Sunnen Precision Honing Used in Finishing Gauges to .00002" at C. G. Conn Ltd.

On valve casing gauges, used in making the famous Conn musical instruments, the Sunnen Precision Honing Machine is being used to obtain a tolerance of .00002" in high-grade tool steel.

Here's a real precision job that is helping Conn to produce musical instruments, aircraft and marine navigation instruments, electronic testing equipment, silver-coated aircraft bearings, etc.

The Sunnen Precision Honing Machine will hone any surface from .185" to 2.625" in diameter — in any metal or plastic except lead and babbitt — produce a super-smooth finish — with a guaranteed accuracy of .0001" — accurately duplicate sizes — without jigs or fixtures — can be set up in one minute — and does not require skilled labor.

Write for complete information.



SUNNEN PRODUCTS COMPANY

7933 Manchester Ave., St. Louis 17, Mo.

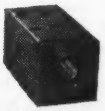
Canadian Factory: Chatham, Ontario

SUNNEN

Typical Jobs



Compressor Yoke. Alignment maintained and better finish produced.



Saved time in producing a smooth accurate finish on this bronze remote control valve body.



Automobile Distributor Shaft Gears. Taper removed at a rate of 80-90 per hour.



Aircraft Hydraulic Brake Cylinder. Honing 3 times faster than lapping — and gave a straighter hole.



Roller Bearing Outer Race. Finish improved from 12 micro-inches to 2 micro-inches.

BUTTERFIELD THRED-RITE DIES

The modern adjustable collet die at its best.

Engineered to meet the demand for screw thread parts production on high speed equipment.



These dies can be used not only in our own Floating and Releasing Type Holders but also in any Holder designed for dies of this type.

For accuracy, speed and long life specify Thred-Rite.

UNION TWIST DRILL CO.
BUTTERFIELD DIVISION

Factories: Derby Line, Vermont, U. S. A.
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STORES:

Cleveland.....2902 Euclid Ave.
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New York.....61 Reade St.

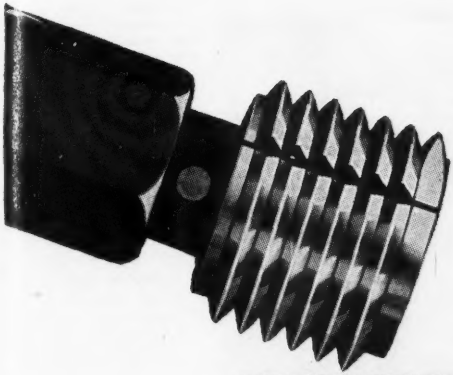
working conditions are improved.

A typical Lincolnweld installation consists essentially of a highly responsive direct current control circuit, including a control exciter on the welding generator; a d.c. motor for wire feed; and simple rheostats for adjusting arc voltage, welding current, and travel speed. The Lincolnweld head includes electrode drive rolls and contacts which are designed to accommodate electrodes from ⅛ to ⅝ inch inclusive without changes. In addition, no changes in control are necessary; the control compensates automatically by speeding up or slowing down the drive motor to suit the electrode size.

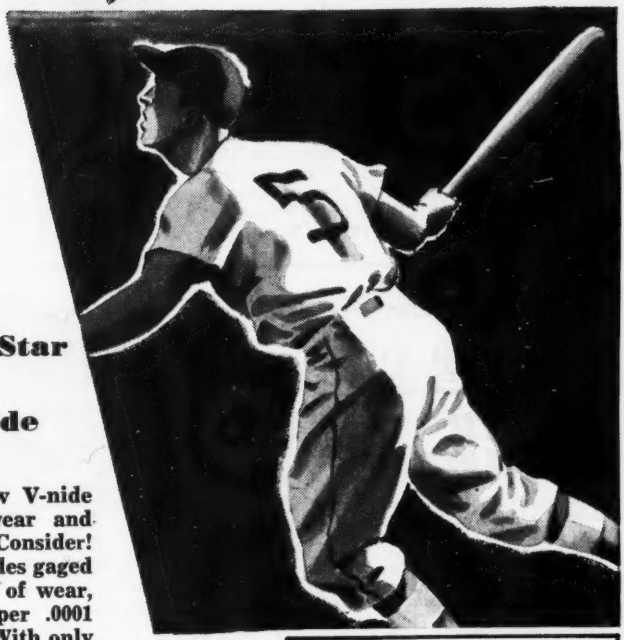


Chemical pressure vessel, 30 inches in diameter x 81½ inches long with ⅝-inch thick body shell, being welded utilizing the "Lincolnweld" shielded arc welding process

The Lincolnweld head can be readily changed from butt welding to horizontal and fillet welding. No changes in head and wire reel are required; they remain in their upright position. According to the manufacturer, this important feature



That Unseen Extra Quality



A Big League Star has it

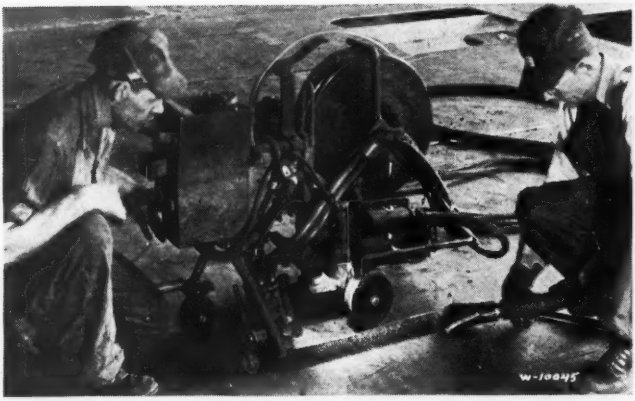
The NEW V-nide has it

Depend on the new V-nide gage for longer wear and accurate checking. Consider! On aluminum, V-nides gaged 4532 holes per .0001 of wear, against 338 holes per .0001 for tool steel gages. With only an approximate 17% increase in price for V-nides, your gaging costs should hit a new low.

Republic Gage Company

GAGES OF LONG LIFE ACCURACY

2228 Fenkell Avenue Detroit 21, Michigan



Tractor type "Lincolnweld" being used to weld a lap joint in a deck plate of an LST landing craft

feed. The travel also start automatically. Adjustment of travel speed, welding amperage, and arc voltage is centered at a control box which provides a quick and easy means for adjustment of these elements to suit the job.

makes the deep root penetration of lap and fillet welds easily obtainable in the horizontal position.

The Lincolnweld arc is started by simply advancing the electrode until it contacts the joint and then pressing the "start" button. The control automatically retracts the electrode which establishes the arc and then maintains the arc length at the proper rate of electrode

Cincinnati Gilbert Universal Table

Consisting of three major parts—a top, middle stand, and base—a universal table which is constructed to withstand heavy drilling strains has been brought out by The Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati, Ohio. The middle stand is designed for tilting 90 degrees on the base, and the

Presenting the Famous

MEAD

AIR CLAMP



For Greater Drill Press Output

Prompt Shipment!

Wherever a drill comes down, *something* must hold the work. Wherever a drilling-jig is required, *Air-Clamp* will simplify it. Wherever *speed* is desired, *Air-Clamp* will produce it. *Air-Clamp* holds with relentless pressure; it is undisturbed by size variations (such as in casting), it scoffs at vibration (how many drills have been broken due to faulty hold-downs?), chatter, snagging. *Air-Clamp* holds work of any size or shape in any position, at any angle. Can pay for itself on a single fixture; saves its cost on a few days' drill-press output. Reduces operator fatigue. Saves hours and dollars in drafting-room, jig department, tool room and production line. *Air-Clamp* fits any drill-press having a cylindrical column. Special fixtures for Tee-slotted tables, light milling work, etc. Hand and/or foot control. Shipped on approval to responsible concerns. Write for new Air Power Catalog.



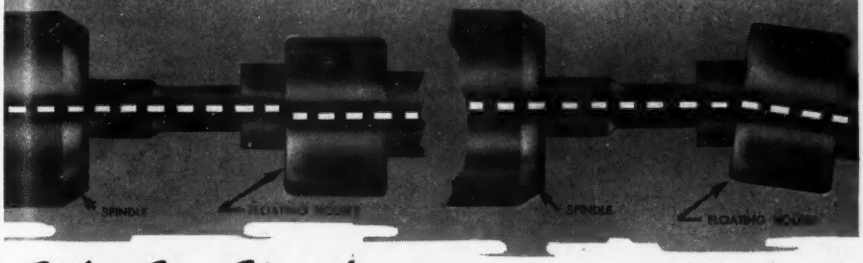
MEAD SPECIALTIES COMPANY

4114 North Knox Ave. Dept. AA-75 Chicago 41, Ill.

Your Troubles

with OUT-OF-PARALLEL or ANGULAR MISALIGNMENT

are over!



(Sketches obviously exaggerated)

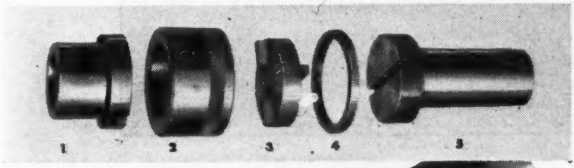
When You Use the

EMPIRE FLOATING TOOL HOLDER

This tool holder really floats!

As a result, every hole you ream—starting with the very first one—will be accurate to size and perfectly round. No more bell mouths! The cap and shank float independently of each other to create a free and easy movement. Composed of only five parts—easily disassembled—the holder has a reduced wear factor.

Available with holes and sleeves in the following sizes: ⅜", ½", ⅝", ¾", 1", 1¼", 1½", with shank diameters: ⅝", ¾", 1", 1¼", 1½", 1¾", 2", 2¼"—for any machines from the smallest Brown & Sharpe Automatics to the largest hand or automatic screw machines.



You can try one for 30 DAYS

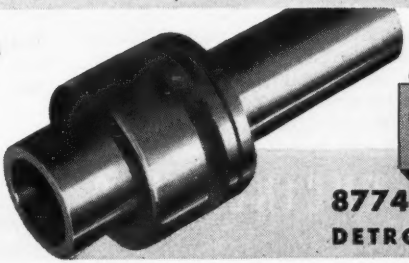
If you're not entirely satisfied, return it for full credit.

BUY MORE BONDS

ONLY **5** PARTS

1 SLEEVE
2 BODY (CAP)
3* UNIVERSAL FLOAT
4 ADJUSTABLE NUT
5* SHANK

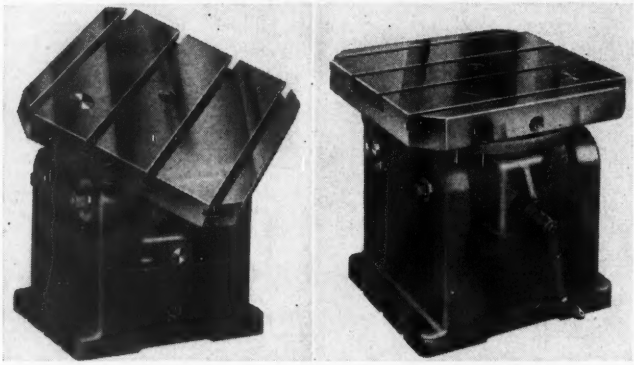
*These distinctive features enable Empire Floating Tool Holders to compensate for misalignment *in all directions.*



EMPIRE TOOL COMPANY

8774 GRINNELL AVE.

DETROIT 13, MICHIGAN



Cincinnati Gilbert Universal Tables

table is arranged to revolve 360 degrees on the middle stand. This construction is said to result in a rugged, rigid table with no objectionable overhang. The design also allows for the drilling of holes in five sides of a box-shaped casting fastened to the table.

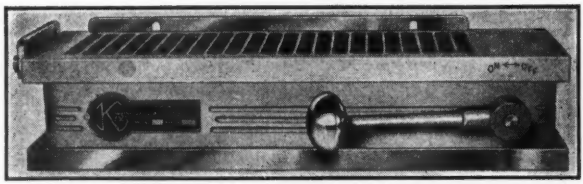
The table top, which revolves on flat bearings, is graduated in ½ degrees and is clamped to the tilting member by four bolts. The top is provided with a center locating hole which can also be used for steadying the ends of boring bars. The tilting member is graduated in degrees and is fastened to the base by two bolts. The tilting mechanism consists of a non-reversible worm and worm-wheel and reduction gearing mounted on ball bearings.

The Cincinnati Gilbert Universal Table is available with two sizes of top—22x22 inches and 27x27 inches.

Welch Allyn "Handylite"

To meet the demand for an illumination instrument capable of being introduced into ordinarily light-obscure areas encountered in inspection work, the

KAR Permanent Magnet CHUCKS



Cannot Fail
Hold Work Tight
Generate No Heat

An outstanding and exclusive advantage of the KAR Permanent Magnet Chuck is its ability to hold smaller pieces securely due to the close spacing of the pole pieces.

Release Easily
Used Wet or Dry
Use No Power

THE KAR ENGINEERING CO., Inc.
GREAT BARRINGTON MASSACHUSETTS

BATH TAPS

provide accuracy

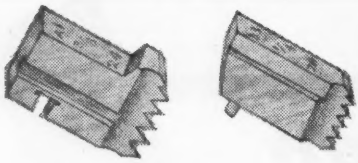


● Bath taps are known throughout the Metal Working Industry for their quality and accuracy.

That's the reason you so often find Bath taps being used for precision and high production work.

John Bath & Company, Inc.

WORCESTER • MASS.



CHASERS

The largest exclusive manufacturers of chasers

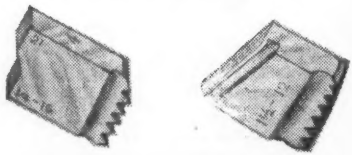
NOW

OFFERS ALL TYPES OF CONVENTIONAL DIE HEAD AND COLLAPSIBLE TAP **CHASERS** WITH GUARANTEED DELIVERIES TO MAINTAIN PRODUCTION SCHEDULES.

LET US SOLVE
YOUR THREADING PROBLEMS

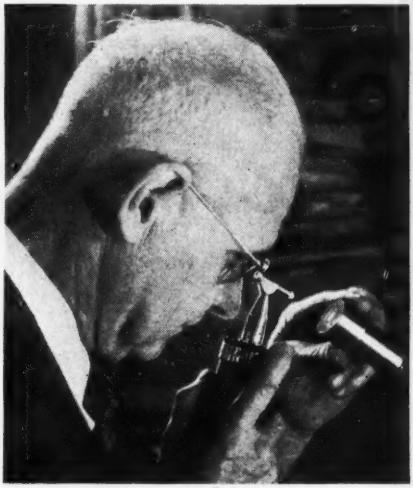


CHAMBERS CHASER CO.
13-19 W. WOODRUFF ST.
HAZEL PARK, MICH.



Welch Allyn Co., Auburn, N. Y., has placed on the market the "Handylite" illustrated herewith. This conveniently angled instrument produces a beam of light that is controlled by a rheostat and is directed in the line of sight of the magnifying lens.

The magnifying lens is approximately 4½-inch focus and doubles the size of the image. Illumination can be provided either by batteries of a standard type in the handle of the instrument, or a special handle with a cord and transformer can be plugged into a standard 110-120 volt current.



Welch Allyn "Handylite"

The lamp is of special construction, providing adequate light for accurate inspection. The light head is detachable from the handle, thus allowing for installation of other types of Handylite attachments where different inspection problems are encountered.

DuBo Plug Gage

Designated as the DuBo, a plug gage of the fixed limit type for thoroughly checking the internal conditions of bores, has been developed by the Standard Gage Co., Inc., Poughkeepsie, N. Y. Unique in appearance, the gage is available in a wide variety of sizes. The small sizes, from 0.240 to 1.510-



You'll get better hole finish with Staples Expansion Reamers because they are easily adjusted to .0001 inch: and longer tool life because they can be expanded several times without a regrind.

You'll get lower production costs, too, because of more accurate reaming, more reamed holes per grind.

The tool body of the Staples Expansion Reamer is solid—not slotted or split. This provides rigidity and accuracy. To expand, simply drive in the plug. Expansion is accurate and uniform. Cutting blades remain perfectly concentric.

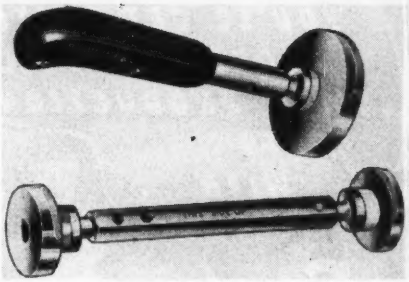
Made originally to meet the precision standards of the aircraft industry, Staples Tools are now available for general use in the metalworking industry. Send today for the Staples catalog of quality cutting tools, including *standard tools available from stock.*

Staples Tool & Engineering Company
Cincinnati 25 . . . . . Ohio

Staples **CARBOLOY-TIPPED CIRCULAR CUTTING TOOLS**

REAMERS • CORE DRILLS • SPOT FACERS • COUNTERBORES • END MILLS • SHELL END MILLS • ALSO A COMPLETE LINE OF CIRCULAR SPECIAL TOOLS

inch diameter, have their "go" and "not go" gaging members attached to the opposite ends of lightweight metal handles. The larger sizes, from 1.510 to 6.010-inch diameter, are of the single end type with palm-fitting plastic handles. Both types utilize an effective color identification system to eliminate wasted motion and risk of errors in selecting the proper gage. "Go" members of both the double and single-end DuBo Gages are each marked with a broad band of vivid green enamel under a durable, transparent plastic ring. "Not go" members are similarly identified by brilliant red bands. The handles of the double-end gages also carry corresponding dots of color.

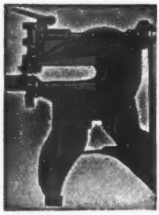


(Above) Single-End DuBo Gage (Below) Double-End DuBo Gage

The head of the DuBo Gage comprises a relatively thin disc which is a section of a sphere. The spherical gaging surface is designed to make contact with the bore walls only at the instant and point of bore gaging. Two chamfered sections, diametrically opposed on each member, enable the gage, by slightly tilting the handle, to be introduced into bores easily without force or danger of marring even the most highly polished workpieces, it is claimed. In addition to the checking of deep bores, the design of the DuBo gaging members also permits accurate gaging to practically the bottom of blind bores. The chamfered edge serves an additional function in tending to wipe away foreign material from the gaging area and thus helps to prepare a clean surface for accurate gaging.

The DuBo Gage is well proportioned and unusually light in weight. The thickness of both members of a double-end DuBo is the same, thus affording an even balance that greatly adds to

GRAY TURRET HEAD METAL CUTTER OR NIBBLER



GRAY, Originator of First Practical Metal Cutter or Nibbler

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tubing, Sheet & Plate Shops

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GOOD MACHINE TOOLS INSURE PERFECT RESULTS AND TOP PRODUCTION

Specify "QUALITY" H. S. Woodruff Keyway Cutters When You Have a Tough Job To Lick

QUALITY TOOL WORKS
WAUKEGAN ILLINOIS

short cut to efficiency!

THE **DIAMOND TOOL FOR FINISHING**

the NEW LARCO PD*
(PRODUCTION DRESSER)

Whole Diamond Blocks Used Exclusively. Can be used for all kinds of straight dressing of abrasive wheels.



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EVENLY DISPERSED DIAMONDS



NO RESETTING NECESSARY
ALWAYS A FINE DRESSING SURFACE

speed and efficiency are PD features:

- only sharp, cutting diamonds used
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- solidly embedded in specially developed matrix
- diamonds won't break or pop
- no resetting, new sharp diamonds exposed as needed

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LARCO DIAMOND TOOL CO.

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DIAMOND TOOL CO.
551 FIFTH AVENUE
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LARCO makes up PD Tools in ALL SIZES to fit any machine. Standard shanks 7/16" x 3" and 1/2" x 3". Guaranteed diamond weight from 1 to 20 carats, starting from $17.

LARCO DIAMOND TOOL CO. **MM-6**
551 Fifth Avenue, New York 17, N. Y.

Please send further information on Larco's PD (Production Dresser).
Please have representative call_____(check)

Name_____

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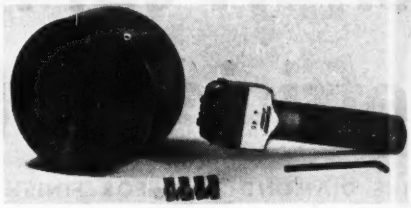
City_____ **State**_____

the ease of handling the gage. Gage members are of highly lapped special alloy steel, and since the actual contact between the spherical surfaces of the gage heads and the bore is very light and friction-free, wear is claimed to be negligible.

New Method Convex Marker

A holder for marking part numbers, dates, serial numbers, and so on, with steel stamps on the periphery of solid round stock has been designed by New Method Steel Stamps, Inc., 149 Jos. Campau St., Detroit 7, Mich. As shown in the accompanying illustration, this convex marker is so constructed as to allow for the stamping of bars with their periphery rather than longitudinally.

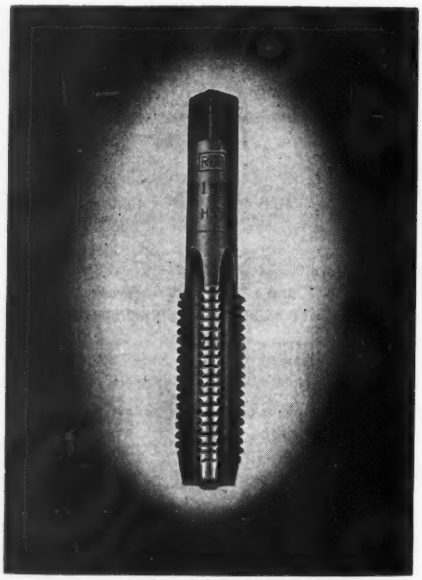
The interchangeable steel type, which is held in place by means of two set screws, is tapered in such a manner that when assembled in the type retaining mortise together with wedges, a predetermined radius is automatically formed by the sharp marking surfaces of the stamps. In the case of the four character convex marker illustrated herewith, the stamps form a 2-inch radius for the marking of 4-inch bars. The individual pieces of type bottom flat against a hardened steel anvil, thus



New Method Convex Marker

ensuring impressions of equal depth and clarity for all characters by one blow of a hammer.

The New Method Convex Marker is of a "semi-standard" design, since devices having different radii and character capacities can be readily made to meet individual requirements. The handle of the holder is knurled to allow for firmly gripping and is tempered to provide for long service under severe conditions.



WHAT TAP

When you choose the make of tap for your next

PEACE OR WAR

time job, it is your inherited privilege to get the tools of your choice. All Americans now have cause to rejoice in their right of Free Choice, which has demonstrated our ability to make the world's best munitions of war as well as the best Peace time products.

Reiff & Nestor Company's Taps *must* be good Taps. We invite you to try them.

Send for Reiff & Nestor Catalogue and Tapping Guide. A request on your Letter Head brings it.

REIFF & NESTOR COMPANY

...Manufacturers...

LYKENS PENNSYLVANIA

Morton's SALT TABLETS



NOW AS FAMILIAR AND NECESSARY AS THE FIRST AID STATION

In the middle thirties salt tablets were a novel idea. Today practically all leading industrial plants wouldn't think of eliminating either salt tablets or first aid stations. Both are essential—the one to help prevent accidents, the other to repair them.

When workers sweat, their bodies lose essential salt. This loss causes Heat-Fag, inalertness, fatigue, heat prostrations. Accidents increase. Production goes down.

Morton's Salt Tablets at every drinking fountain provide an easy, simple, effective way to restore this vital salt lost through sweat. The cost is less than a cent a man per week.

In salt tablets, as with other grades and types of salt, Morton is the recognized leader. Order Morton's Salt Tablets and Dispensers from your distributor or directly from this advertisement. Write for free folder today . . . Morton Salt Company, 310 S. Michigan Ave., Chicago 4, Ill.

MORTON'S SALT TABLETS

Morton's Salt Tablets are available either plain or with dextrose.

Case of 9,000, 10-grain salt tablets - - - - - - $2.60

Salt Dextrose Tablets, case of 9,000 - - $3.15

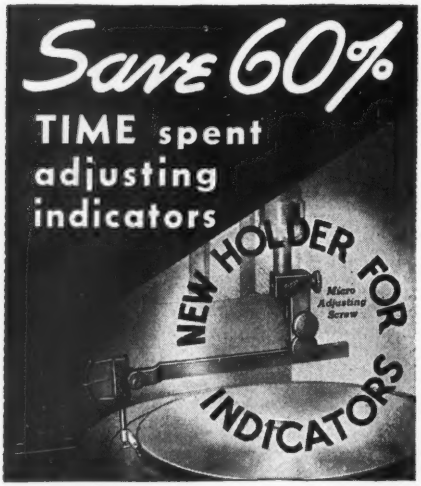
MORTON'S DISPENSERS

They deliver salt tablets, one at a time, quickly, cleanly—no waste. Sanitary, easily filled, durable.

800 Tablet size - - $3.25



MORTON'S SALT TABLETS



For Jigborers, Boring Mills, Milling Machines. It fits all popular indicators. The above illustration shown complete with extension bar.

NO more tiresome tapping your indicator into position. Now—after locking to approximate position, you obtain final setting by simply turning Micro Adjusting Screw. This exclusive, time-saving feature of the OSLUND HOLDER for all popular indicators gives you ***complete control.*** Write today for details.

Another Time-Saver



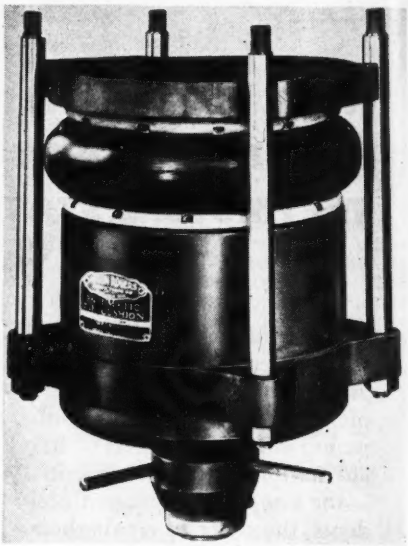
This Holder produced by makers of Oslund Indicator — the shockproof, constantly accurate indicator, whose 360° dial is read from ***all*** sides. Write Oslund today.

Oslund

TOOL & DIE CO.
14 Sigourney St.
Hartford, Conn.

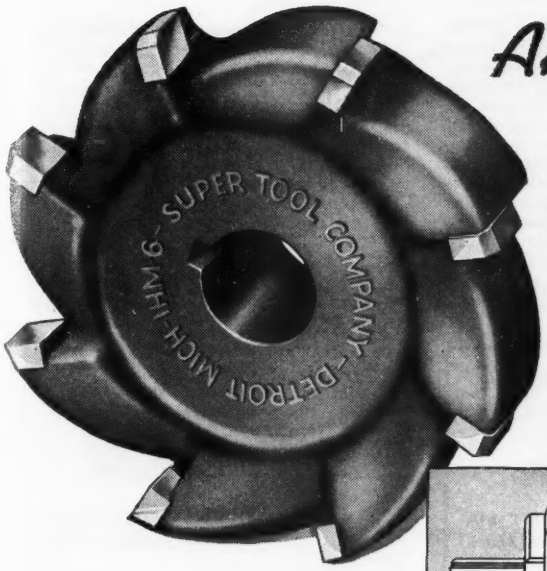
Dayton Rogers Bellows Type Pneumatic Die Cushion

The Dayton Rogers Manufacturing Co., 2835 S. 12th St., Minneapolis, Minn., has developed a pneumatic die cushion employing a molded synthetic rubber bellows which is arranged to absorb the die cushion travel of the hardened and ground pin pressure pad. According to the manufacturer, the unit is constructed to withstand working pressures up to 300 lb. per square inch. The synthetic rubber molding is said to be unaffected by oil in the air line, grease, or drawing compounds. Air leakage is claimed to be reduced to a minimum as a result of the balloon tire bellows construction. In addition, no regulating air-reducing valve is required. The die air jack is changed from the shop air line to a predetermined pressure recorded on a pressure gage included with each installation.



Dayton Rogers Bellows Type Pneumatic Die Cushion

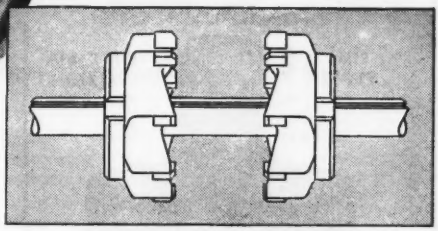
The Dayton Rogers Bellows Die Cushion is made in sizes from 5 to 12 inches, having drawing capacities up to 5 inches, and can be used efficiently on all deep drawing jobs within its capacity, as well as for pressure pad control on a large percentage of forming



Announcing-

the New

SUPER HALF SIDE MILL!



Designed to be used in pairs for straddle milling or singly to cut on one side only

Another Addition to the Most Complete Line of Carbide Tipped Cutters on the Market!

Here's another Super development—another addition to Super Tool's extensive line of Carbide Tipped Tools! The New Super Half Side Mill!

Here is a rugged, heavy duty tool designed for the tough jobs . . . those production jobs that are too heavy for regular half side mills.

Made in both right hand and left hand, these half side mills are available in a range of sizes from 4" to 12" in diameter. They are manufactured in three types for non-ferrous, cast iron and steel. Designed for straddle milling, they can be mounted individually on an arbor to cut on one side only.

Most sizes are now available for immediate delivery from stock. The complete range of sizes will be available from stock soon. Write, wire or phone for complete data and prices.

SUPER TOOL COMPANY

Carbide Tipped Tools

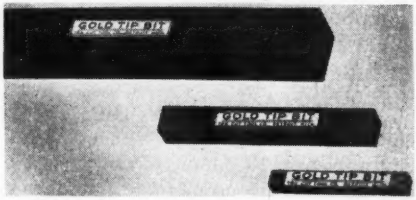
21650 Hoover Road, Detroit 13, Michigan ★ 4105 San Fernando Road, Glendale 4, California

dies, including ejector work, and so on. Off-center loading on the hardened and ground pin pressure pad is compensated for by a heavy duty pin pressure pad guide stem which also serves as an adjustable feature. As a result of this construction, the operator can stop the pin pressure pad at a predetermined height, compensating for bolster plate thickness variation and the increase or decrease in the length of pressure pad pins. All adjustments are made by an adjustable handwheel which is located on the end of the pin pressure pad guide stem and is provided with a locking means for maintaining adjustments.

The Dayton Rogers Bellows Die Cushion can be readily fastened to the bolster plate of the average press by the four suspension rods. The unit is also designed so that a supporting structure can be employed, thus making it possible to fasten the suspension rods to the press pad and allowing the bolster plate to be removed without removing the die cushion unit.

Tru-Cut "Gold-Tip" Tool Bits

The Tru-Cut Tool Co., 14236 Birwood Ave., Detroit, Mich., is now marketing a line of precision ground tool bits



Tru-Cut "Gold-Tip" Tool Bits

under the trade name of "Gold-Tip." Especially designed for heavy cutting on scaley materials such as forgings and castings, as well as for hogging and rough cuts, the bits, with a Rockwell hardness of 62/64, will not chip or break and afford effective performance on intermittant operations, it is claimed.

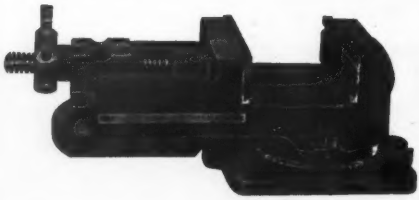
Included in the Gold-Tip line are square bits ranging from $\frac{3}{16}$x$\frac{3}{16}$x2½ to 1¼x1¼x7 inches in size, flat bits ranging from ½x⅝x5 to 1¼x1½x8 inches, and cut-off blades ranging from $\frac{3}{32}$x½x4½ to $\frac{5}{32}$x1x6 inches. Each tool bit is supplied ready for use.

STANDARD US SINCE 1915
HEADS
FIVE TYPES
FIFTY-SIX SIZES



Two Spindle Head
Both Spindles
Adjustable
United States Drill Head Co.
Cincinnati 4, Ohio

GEM DRILL PRESS AND MACHINE VISES...

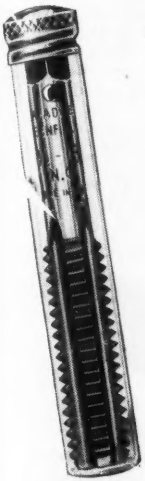


Modern Vises for Tool-room and Production. Sizes ranging from 3" to 10¼" opening. Strong, Versatile, Quick-Acting. Pay for themselves in time-saving.

Write for circular describing entire line of GEM MACHINE VISES.

J. E. MARTIN MACHINE WORKS
548 State St. Springfield, Ohio





A good thing to think about in JULY

No matter how hot the production pace Threadwell COLD-TEMPER Taps have a refreshing way of turning out clean, accurate threads and more of them per tap. Threadwell *cold-tempering* at 120° below zero refines the metal structure all the way through. It's not just a surface treatment. Threadwell *Cold-Temper* Taps cut better threads and keep on cutting them longer between each sharpening.

Try them on steels, cast iron, alloys, plastics—any tapping job however tough. You'll never go back to ordinary heat-treated high speed taps.

All you need to do is ask your local Threadwell Distributor to make the next lot COLD-TEMPER Taps.

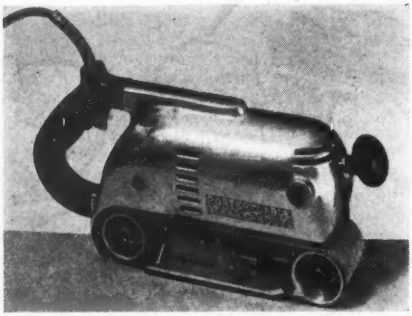
Perspiration-Proof, Too!

Threadwell *Cold-Temper* Ground Thread Taps come in this perfect protective package—the TAP-CAPSULE. It seals out dust, dirt and sweaty fingers yet permits instant identification before unwrapping. *Threadwell greaseless rust-proofing* makes every tap clean and dry to handle, always ready for instant use.

DISTRIBUTORS IN LEADING INDUSTRIAL CENTERS THROUGHOUT AMERICA
EXPORT STOCKING DISTRIBUTORS
CANADA, Bridge Machinery Co., Montreal;
ENGLAND, Skylux Ltd., London and John H. Graham and Co., Inc.
THROUGHOUT THE WORLD

Threadwell
SINCE 1902
"TAPS OF DISTINCTION"

THREADWELL TAP AND DIE COMPANY · GREENFIELD, MASSACHUSETTS, U.S.A.



Porter-Cable Model A-3 "Take-About" Surfacer

Porter-Cable Model A-3 "Take-About" Surfacer

A lightweight, easy-to-handle portable electric surfacer for high speed light duty sanding and grinding operations on metal, plastics, and other materials is announced by the Porter-Cable Machine Co., 300-4 Wolf St., Syracuse 8, N. Y. Designated as the Model A-3 "Take-About," the unit features a streamline, well-balanced design; aluminum die-cast polished frame; plastic handle; quick-acting trigger switch in the handle; silent chain drive; needle bearing drive and idler pulleys; and rubber-covered drive pulley.

Specifications of the Porter-Cable Model A-3 Take-About Surfacer are as follows: Motor, ¾ h.p., universal d.c.-a.c., 25-60 cycle, single phase, either 115 or 220 volt; belt size, 3x24 inches; belt speed, 1,600 s.f.p.m.; pulley size, 3x2¼-inch diameter; size overall, 5⅛x16x7¾; net weight, 14 lb.; shipping weight, 21 pounds.

De Burrette De-Burring Process

A process whereby precision machined parts can be de-burred and finished at a rapid rate, to be known as the De Burrette De-Burring Process, is announced by the De Burr Barrel Co., Inc., 4577 Hollywood Blvd., Los Angeles 27, Calif. Both soft metal and hardened steel parts can be de-burred with a smooth overall finish in quantity lots by means of the process. Tolerances of 0.001 inch, which must be held for grinding and lapping, are said to be



Yes, Sir! Here Is A Diamond Tip Dressing Tool that Every Shop needs



This Meinhardt 2S Diamond Tool is the most all-around useful dressing tool in those shops with grinding wheels up to eight inches in diameter. The reason that the 2S cuts faster, lasts longer and is easier to use, is that it is engineered for the broadest range of hard service. And the 2S is made of the finest materials, by skilled workmen —another assurance of superiority.
Yes, Sir, *your* shop really needs

MEINHARDT DIAMOND TOOLS No. 2S

You need—every shop needs—at least a dozen Meinhardt 2S's because its use is called for so frequently. To facilitate your ordering we pack and price this 2S—the finer all-purpose dressing tool in dozen lots. 1 dozen, $36.00; 2 dozen, $70.00.

Two standard sizes—

$\frac{7}{16}$" with 3½" nib
⅜" with 2½" nib

In stock for immediate delivery.

Ask for catalog of full line 645.

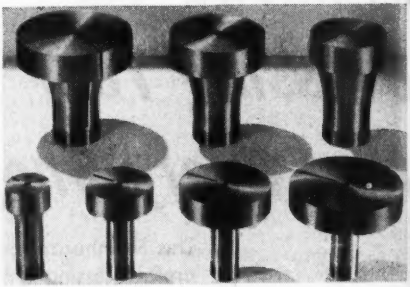
MEINHARDT DIAMOND TOOL CO. 2810 Milwaukee Ave. CHICAGO 18, ILL.

unaffected. Burrs, it is claimed, are not ball peened or soft metal parts marred since the De Burrette Barrel used cushions the load as it grinds and polishes.

The De Burrette Barrel is lined throughout with a soft Neoprene rubber impregnated with an aluminum oxide abrasive. Since each particle of the abrasive is rubber mounted, the cutting action is cushioned and the softest metals are not scratched, it is claimed. However, the constant, even sliding pressure of the barrel on the metal provides a fast cutting action. The large diameter, narrow octagon-shaped barrel is used dry and includes a variable speed transmission which permits adjustment for a wide range of loads of varying character and weight.

Zagar Over-Capacity Step Collets

A line of over-capacity step collets available for both 1 and 2-inch Zagar collet fixtures is now being marketed by Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio. The 2-inch collets (Zagar Tool No. 301) are made in 3, 4 and 5-inch head sizes, and the 1-inch collets in 2, 3, 4 and 5-inch head sizes.



Zagar Over-Capacity Step Collets

The 2-inch collets can be used wherever a Type "5-C" collet is employed. The heads are 1-inch thick and are made of M-tempered tool steel which is finish ground and left in a soft condition so that the user can bore accordingly to meet the requirements of the specific job at hand. Machining and heat-treating instructions are included with each collet.



Cut Set-Up Time
75% through use of the
New Advance Clamps
(the only T-slot clamps)
Clamp directly over work. For use on all machines with T-slots. Standard and Heavy-Duty type.
Write for circulars.
ADVANCE MACHINE WORKS
3727 Weisser Park Fort Wayne, Indiana



TYPE HOLDERS AND TYPE ROLL MARKERS
HAND STAMPS LOGOTYPES DIES STANDARD
AND SPECIAL STAMPS INSPECTORS' STAMPS
MACHINE ENGRAVING PRECISION DUPLICATING
NEW METHOD STEEL STAMPS, Inc.
149 Joseph Campau, Detroit 7, U.S.A.

New Nesting Type Tote Pans



20" long x 12" wide x 6½" deep.
16 ga., drag holes and handles both ends.
J. L. LUCAS & SON, INC.
Bridgeport, Conn.



SHAPING FILLETS on metal parts or patterns—getting in behind overhanging lugs or projections—deburring or countersinking holes in hard-to-get-at places (like the inside of a tube) . . . these indicate the versatility of the Nicholson Ball Shape Rotary File operated by portable tool or flexible shaft.

The Ball is one of 16 shapes Nicholson regards as standard for covering all practical machine-shop applications of rotary files.

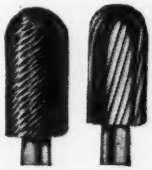
Each shape is offered in either Hand Cut or Ground type. The former, when no longer serviceable as such, can be converted into Ground type. The latter can be resharpened—usually a number of times—at slight loss of diameter.

WRITE FOR CATALOG AND PRICE LIST — and for any help desired in the selection of *The right file for the job.* For ordering, contact your mill-supply house.

NICHOLSON FILE COMPANY, 93 Acorn St., Providence 1, R. I.
(In Canada, Port Hope, Ont.)

16 STANDARD SHAPES

(In either Hand Cut or Ground). 3 cuts — Coarse, Medium, Fine. Diameters 1/8 to 1 1/8 Inch.



Hand Cut **Ground**

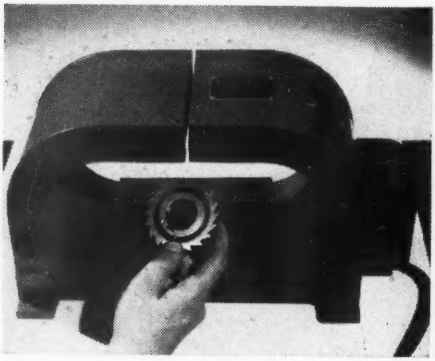
NICHOLSON ROTARY FILES

HAND CUT AND GROUND—FOR EVERY PURPOSE

NICHOLSON U.S.A.

Jay Improved Tool Demagetizer

An improved demagnetizer whereby tools are said to be completely demagnetized in one pass through its field has been brought out by the Jay Electric Co., 5664 St. Jean Ave., Detroit 13, Mich. The standard size of the unit is such as to allow for the demagnetizing of most cutting tools, however, on order, the unit can be made of any size to meet special requirements.



Jay Improved Tool Demagnetizer

A-C Welding Electrodes

A-C Nickel Manganese, A-C Mo Mang Manganese, X2 and X3 electrodes are new additions to the Allis-Chalmers arc welding electrode line, the company has recently announced. The A-C Nickel Manganese and the A-C Mo Mang Manganese have wide application in the mining, cement, and railroad industries for repair and building of worn equipment. Characteristics of the weld deposit allow it to work-harden to 550 Brinell.

Hard surfacing electrodes X2 and X3 are used to protect parts subject to extensive wear, the X2 for severe abrasion and mild impact and the X3 for severe impact and mild abrasion.

A-C Nickel Manganese and A-C Mo Mang Manganese are available in assorted sizes, both bare and coated, the coating being a combination, suitable for both a-c and d-c welders. X2 and X3 electrodes are available in assorted sizes with combination coating only.

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

NEW! No. 38 BENCH SHEAR

A small, powerful throatless type shear with capacity up to 3/16" mild steel. Cam action provides straight up - and - down blade travel. Length of blade 5". Size overall 11" x 8¾ x 7½". Weight 45 lbs. All parts interchangeable for easy replacement. Write for circular.

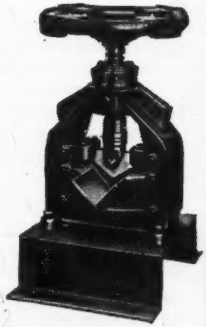




No. 5 JR. PUNCH

NEW! No. 162 SHEAR

For cutting off angle iron up to 3" x 3" x ¼" clean and square *with no distortion of ends.* Double cut blade shears both sides. Ball Bearing Screw Action provides maximum power with minimum effort. Easily operated by one man for bench or floor use.



A handy tool for all sheet metal workers. Capacity ¼" hole in 16 ga. iron. Will punch in center of 4" disc. In metal kit box complete with 7 punches and dies.

Write for New No. 16-45 Catalog.

WHITNEY METAL TOOL COMPANY
110 FORBES ST • ROCKFORD ILL

The SUPER METHOD

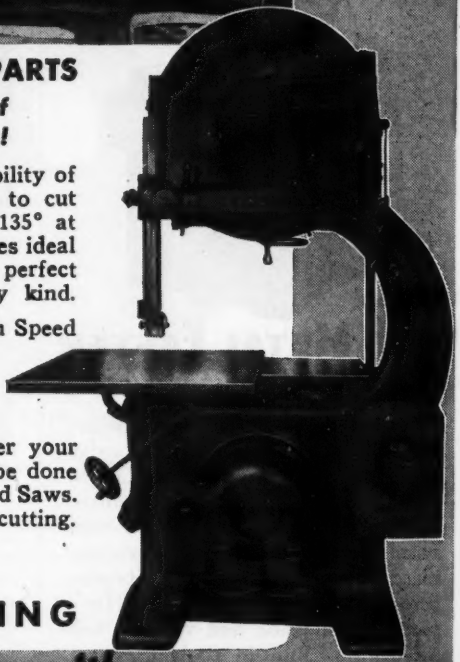


of TRIMMING FORMED PARTS

and performing a host of other metal cutting jobs!

The negligible down-drag and the ability of Tannewitz High Speed Band Saws to cut sheet metal from 90° to near 0 or 135° at tremendous speed make these machines ideal for trimming. Cuts can be made with perfect safety without using a rest of any kind.

Friction sawing with Tannewitz High Speed Band Saws also results in perfectly amazing time savings in the cutting of flat sheets, soft or hardened steels, armor plate, plastics, glass and many other materials. Whatever your cutting problem, chances are it can be done better and faster with Tannewitz Band Saws. Investigate this "Super" method of cutting.





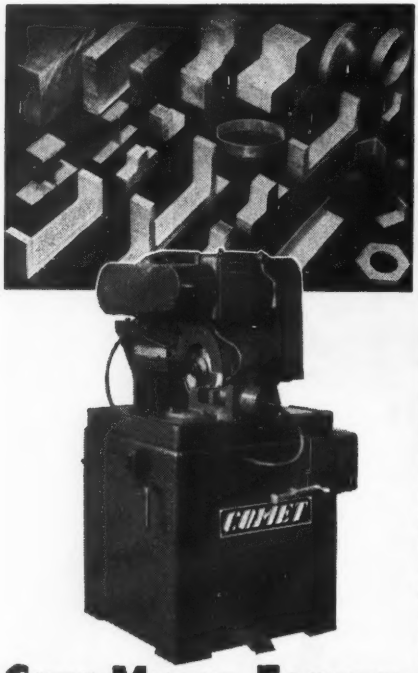
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FRICTION SAWING

with **Tannewitz**

HIGH SPEED BAND SAWS

THE TANNEWITZ WORKS GRAND RAPIDS 4, MICHIGAN



CUTS METAL FASTER
More Accurately

If you require accurate, high-speed cutting of non-ferrous metals and other materials, here is your machine. Cuts by smooth, fast, milling action. Pneumatic hydraulic feed is coordinated with speed of cutting blade. Vise synchronized with action of ram. No vibration because of weight distribution. Has 4 speed transmission and variable feed mechanism. Built-in coolant system. Properly operated, blade breakage is eliminated. Write or wire for free literature.

CONSOLIDATED MACHINERY & SUPPLY CO., LTD.
2031 SANTA FE AVE., LOS ANGELES, 21, CALIF.

COMET
AUTOMATIC CUT-OFF MACHINE
MODEL MH

Federal Metricator Air Gaging System

An air gaging system to be known as the Federal Metricator Air Gaging System is now being marketed by Federal Products Corp., 1144 Eddy St., Providence 1, R. I. The system consists of a graduated column and a gaging head. A manometer tube, built into the water column, indicates variations in the air pressure.

The standard gaging head is constructed with two measuring orifices which are recessed with respect to the outer skirt of the gaging member. This



Federal Metricator Air Gaging System

recessed construction of the orifices of the gaging head permits a part whose surface is easily marred to be precisely gaged without the surface of the part actually touching the gaging member. In addition, the recessed design of the gaging head contributes to the maintenance of the operating accuracy due to the fact that the protective outer skirt of the gaging member can wear considerably before the two measuring orifices themselves show signs of wear.

As the space between the measuring orifices and the part being gaged increases, the air flow increases and the water column raises in the manometer tube. This results in a plus reading when gaging a hole diameter. If the diameter of the hole being gaged is oversize, the air flow is decreased and

Announcing



CARBIDE TIPPED FACE MILLS AND SHELL MILLS

Designed for High Speed Milling

Nelco Carbide Tipped Milling Cutters have been developed for machining all metals, at speeds and feeds far in excess of those commonly used. Massive design, correct grade heavy carbide tips and special cast iron alloy bodies make Nelco Cutters leaders in the field.

Trained Nelco Tool Engineers are at your service. Write for an "on the job" demonstration of these *new* Carbide Cutters.

Catalog on request

Nelco Tool Co., Inc., New York

Factory: 370 Hamilton Ave., Brooklyn 31, New York

this is expressed by a minus reading on the scale.

The Federal Metricator Air Gaging System operates under air pressure of approximately 1 lb. and can be attached to the regular plant air supply. Variations in the air line pressure do not, it is claimed, affect accuracy of readings on the scale, since the pressure in the gaging system can be kept constant by maintaining the water in the instrument at the proper static level.

Amplification is four thousand to one, which means that measurements within 0.000025 inch are easily readable on the scale. One ten thousandth of an inch is represented by approximately ½ inch on the scale. Practically any inside dimension down to ⅛ inch diameter and any outside dimension down to ¼ inch diameter and other dimensions of depth, width, and so on, can be gaged singly or together. Diametral pitch, taper, bellmouth, barrel shape, and out-of-round can be precisely gaged in one operation. Stepped holes or holes having several diameters can be measured simultaneously by using a composite gaging member.

Wittek Type WWD Hose Clamp

Made to Specification AN-FF-C-406A, an improved worm drive hose clamp designated as the Type WWD is now being



Wittek Type WWD Hose Clamp

offered by the Wittek Manufacturing Co., Chicago 23, Ill. The clamp features an inner band of stainless steel which protects the hose from the serrations in the outer band and distributes the load uniformly to provide for unusual strength and sealing characteristics.







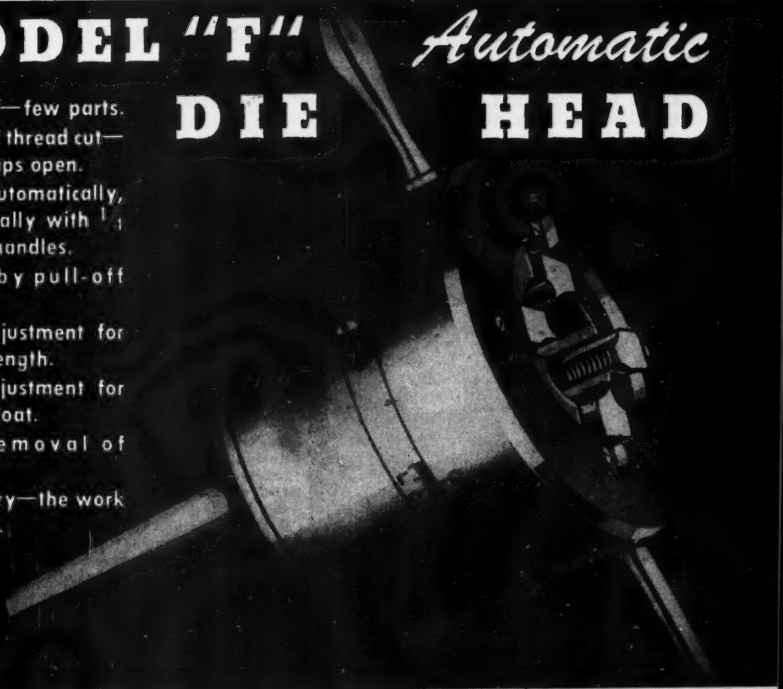


Rickert Shafer

FOR 35 YEARS

MODEL "F" DIE *Automatic* HEAD

1. Compact—few parts.
2. At end of thread cut—head snaps open.
3. Reset automatically, or manually with $\frac{1}{4}$ turn of handles.
4. Opens by pull-off method.
5. Easy adjustment for thread length.
6. Easy adjustment for lateral float.
7. Easy removal of chasers.
8. Stationary—the work revolves.



RICKERT-SHAFER CO. • ERIE, PA.

HEADS • COLLAPSIBLE TAPS • BORING HEADS

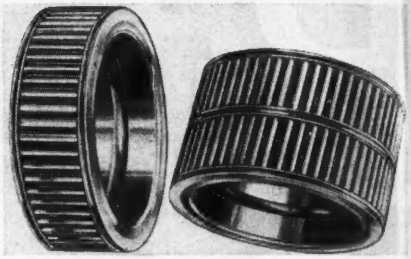
TAPPING MACHINES • SPECIAL THREADING MACHINES

Made of stainless steel and designed to utilize to full advantage the physical properties of this material, the Wittek Type WWD Hose Clamp includes a compact streamlined housing and hardened one-piece thumb-screw. It is available in eight adjustable sizes.

McGill Type IR Inner Race and Roller Assembly Solidend Multirol Bearing

The McGill Type IR Inner Race and Roller Assembly Solidend Multirol Bearing now being offered by the McGill Manufacturing Co., Inc., Valparaiso, Ind., is especially designed for applications where parts which have been heat treated to obtain surface hardness can be uutilized as outer raceways.

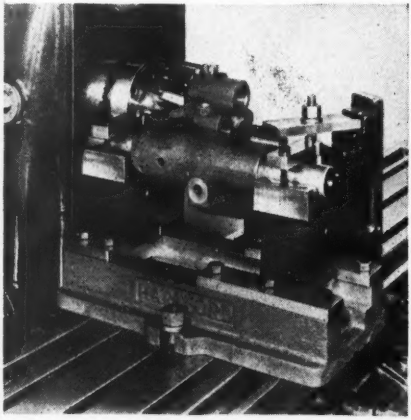
Self-contained and made in both single and double row types, the bearing features rounded end rollers which provide great load capacity. The absence of loose retaining rings is said to simplify bearing installation. Close tolerances and unusual rigidity are said to provide for maximum bearing efficiency and eliminate vibration and noise. In addition, the bearing has no delicate parts to warp, break, or loosen, the manufacturer claims. The races and rollers are made from thoroughly hardened high-carbon chrome steel.



McGill Type IR Inner Race and Roller Assembly Solidend Multirol Bearings

Comtorplug Amplifier Model P-2

To further add to its unique stability for precision gaging by relatively un-



HARTFORD

V-BLOCK FIXTURE

The Hartford V-Block Fixture provides a rapid, accurate and simplified method of setting up work for milling, boring, drilling and inspection.

The Hartford V-Block Fixture is of simple design, consisting of semi-steel base accurately machined and scraped. Cross keyways and ample clamping facilities are provided for holding the base to a machine table. A set of clamps for positioning the V-blocks in the base permit adjustment of the V-blocks. Hardened and accurately ground V-blocks with clamps for holding test bars or arbors in place make the unit complete.

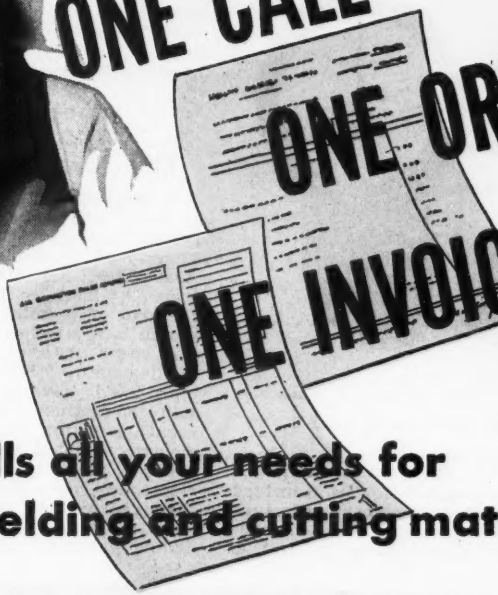
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THE HARTFORD SPECIAL MACHINERY CO.

HARTFORD 5 **CONNECTICUT**



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ONE ORDER
ONE INVOICING





fills all your needs for welding and cutting materials

SAVE time and bookkeeping and enjoy greater buying convenience by making Airco your source of supply for welding and cutting needs. Airco offers high-purity oxygen, industrial and rare gases, torches, tips, regulators —everything for welding, cutting and related processes.

Write for interesting free booklet "Oxygen—Indispensable Servant of Industry". Address Dept. 1W, Air Reduction, General Offices: 60 East 42nd Street, New York 17, N.Y. In Texas: Magnolia Airco Gas Products Company, General Offices: Houston 1, Texas.

AIR REDUCTION

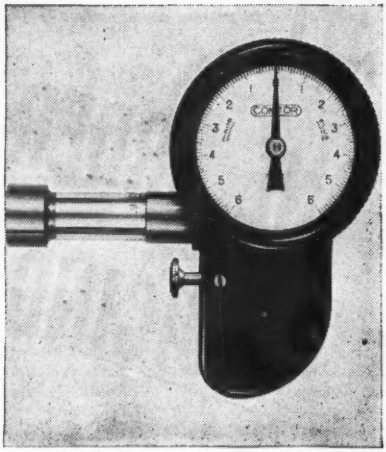
AIRCO

General Offices: 60 E. 42 St., NEW YORK 17, N. Y.

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Offices in all Principal Cities

AIRCO OXYGEN GUARANTEED 99.5% PURE IN THE CYLINDER



Comtorplug Amplifier Model P-2

skilled users, the Comtorplug Amplifier offered by The Comtor Co., 64 Rumford Ave., Waltham, Mass., has been redesigned so as to incorporate a shock-absorbing movement. The redesigned unit is designated as the Model P-2.

According to the manufacturer, the new design provides for complete protection of the mechanism from any possible shock due to extreme or sudden force applied in operation, and is applicable to existing P-1 models.

Elox "Spark Drilling" Method

A method of "drilling" shaped holes in either hard or soft steel utilizing the principle of electrical disintegration is announced by Charles R. Burgess and Associates, 838 Maccabees Bldg., Detroit 2, Mich. The method involves the use of a solid on hollow electrode which is located over the work in much the same manner as for a standard drilling setup. The electrode is then reciprocated several hundred times a minute against the work, the reciprocating action being controlled by an electric solenoid and adjustable to compensate for the weight of the various electrodes required. Water, which flows through the tubular electrode, serves to keep the work cool and to wash away drilled particles. In the case of a solid

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ANY TYPE—Spur, helical, herringbone, bevel, worm, spiral

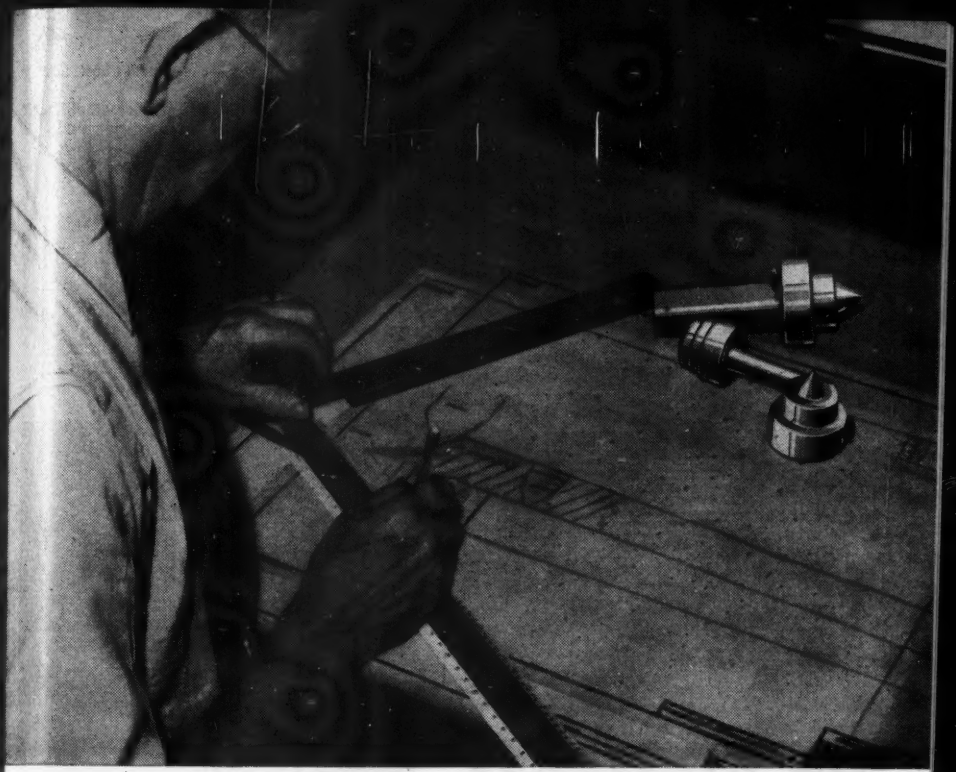
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ANY QUANTITY—One gear or volume production

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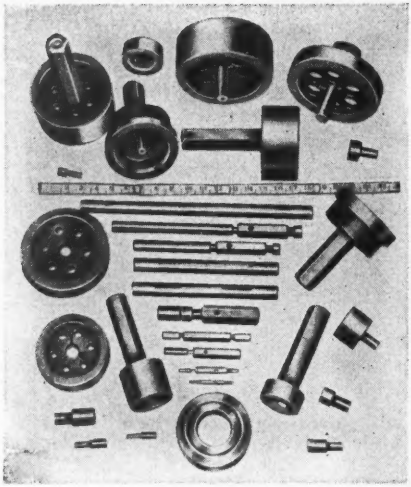
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A properly designed Live Center is one of the fundamentals of setting up a job and requires a specialist's experience. Characteristic of the design of all STURDIMATIC LIVE CENTERS is a low overhang and a slight cushioning action that compensates for expansion due to heat shock and excessive thrust loads—reducing wear to a minimum.

Send us blueprints and specifications—we will see that your job is set up with the right Live Center. Standard Shanks with Morse taper carried in stock.

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LIVE CENTERS

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In 48 Hours

(IN MANY SIZES)

Plug Gages, Ring Gages, Snap Gages (Adjustable and Solid) Built-up Gages, Flush-Pin Gages, Special Gages.

Our Good Gages:

Prevent Spoilage, Utilize Less Skilled Help Speed-Up Operations, Reduce Costs

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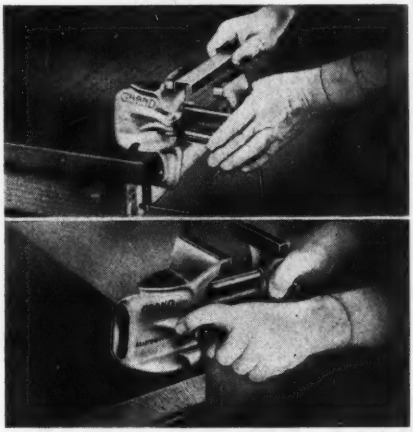
Seld for illustrated folder—M

electrode, the coolant is directed along the outside of same.

Using the Elox "Spark Drilling" Method, holes of desired design or shape can be produced in steel, depending upon the construction of the electrode employed.

Grand "Quikcet" Machinist's Vise

Grand Specialties Co., 3135 W. Grand Ave., Chicago 22, Ill., announces the addition of a quick-action alloy steel machinist's vise to its line of "Quikcet" products. Designed to eliminate the need for running in or out the screw



Grand "Quikcet" Machinist's Vise

in order to close or open the jaws, the vise can be quickly set and closed by simply pushing on the body of the free jaw which slides in swiftly on a ratchet screw and two precision guide rods and can be tightened by means of a turn of the vise handle.

The vise is equipped with a trigger release pawl with ¾ inch of thread which holds the hardened screw under spring tension. The vise is said to open instantly to a full 3 inches by pressure of the thumb or finger on the trigger release after tension has been eased by a single turn of the loose-proof handle. Additional features claimed for the Grand Quikcet Machinist's Vise include extra thick wall body construction. extra heavy precision guide rods, balanced precision grip at all points, and

Newton AUTOMAT



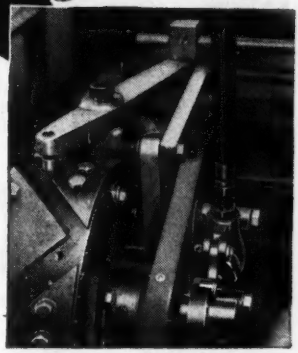
Reliable Automatic for $295

INCREASE PROFITS now and hold your own in the hotly competitive market soon to come. You can do it by converting your hand-operated bench model turret lathes into reliable automatics with Newton Automats.

One operator easily handles *three* Newton Automat-equipped lathes. Labor cost is cut two-thirds. Social Security payments are cut two-thirds. Your manpower headaches will be eased.

Small run jobs can be taken at a profit. Set-up time is the same as for hand-operated turret lathes; production compares with that of costly automatics; hourly machine investment charge is the same as for your present machines as the first job or two pays completely for a Newton Automat installation. Write today for Bulletin.

Below: Cam Set-up and Collet Valve



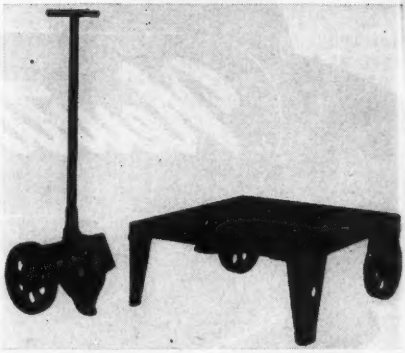


NEWTON MANUFACTURING CO.
215 West 7th Street • Los Angeles 14, California

polished, serrated, and hardened jaws which are integral with the body. The vise is described as spatterproof for welding use, with all working parts and handle copper plated. In addition, the vise is provided with a rust-proof gray wrinkle enamel finish and is equipped with a polished anvil on top and with a bottom screw clamp for quickly shifting to any bench or job, as well as with the usual slots for bolting to a bench for permanent use.

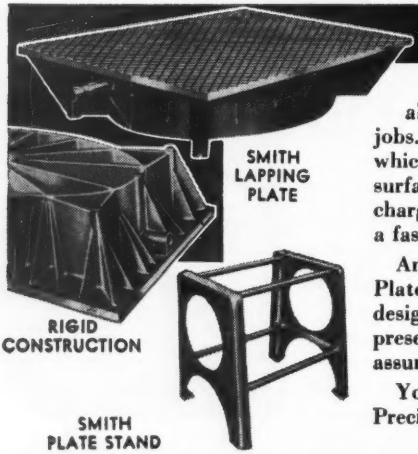
Turner Transport with Four-Way Floor Plate Deck

According to an announcement made by the Factory Service Co., 4615 N. 21st St., Milwaukee 9, Wis., the application of a four-way floor plate deck to the standard Turner Transport chassis increases considerably the number of uses for this materials handling unit. The floor plate deck is welded flush with the top of the chassis on the angles of the frame and is reinforced on the underside by two heavy angles. The non-skid feature of the deck prevents metal parts from "walking off" easily when the transport is in motion. In addition, the embossments provide point contact with hot materials, thus allowing some air space between them and the steel deck and thereby eliminating warping of the deck.



Turner Transport with Four-Way Floor Plate Deck

The Turner Transport can be maneuvered in restricted areas by means



A LAP AHEAD • • •

● Smith Precision Lapping Plates are always "a lap ahead" on intricate lapping jobs. They are grooved in a diagonal pattern, which distributes the compound evenly over the surface — and they're soft enough to take a charge of lapping compound, and hold it. Result: a faster, more accurate lap.

And what's more, Smith Precision Lapping Plates are built for long service. Their scientific design and exclusive type of rib reinforcement preserve their accuracy right out to the edge and assure a permanent flat plate.

You can keep "a lap ahead" with Smith Precision Lapping Plates! Send for information.

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MASTER SURFACE PLATES • LAPPING PLATES • PLANER FINISH PLATES



In Your Post War Plans

Why not decide to get more and better work out of tools, to meet keen competition!

Take advantage of treatments available here which often improve tools 30% to 60% or more. We have specialized in tool treating for a quarter-century. The war has brought new and better methods for original hardening, and also for supplementary treating of tools purchased in a hardened, finished condition.

Now is the time to investigate. Let us show you how other manufacturers have already benefited.

More than half the tools now in common use can be treated so they run longer between grinds, hold size better, and produce a smoother finish.

Our "Silver Finish" is bright, clean hardening.

Our "Nusite" means harder, tougher cutting tools.

Our Ad-Life" improves the tools you buy outside.

Write for booklet, "FIFTY FACTS." It tells what other manufacturers did to improve tool quality and life.



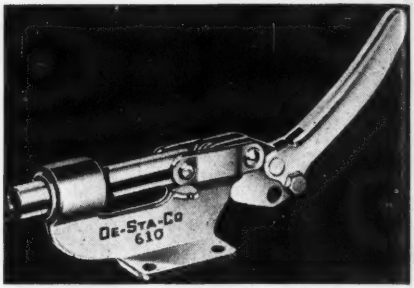
PERFECTION
TOOL & METAL HEAT TREATING CO.
1740-58 WEST HUBBARD STREET CHICAGO 22 ILL

of a hand jimmy, power lift truck, crane, tractor, floor conveyor. With Turner piling stakes, the load may be expanded vertically to any practical height. In addition, steel or wooden bin sections or section trays may be interlocked one on another on top of the transport, thus making available bins as high or low as the job requires.

De-Sta-Co Model No. 610 "Push-and-Pull" Lock Clamp

A larger model "push-and-pull" lock clamp for heavy duty work involving such operations as locating and indexing has been placed on the market by the Detroit Stamping Co., 349 Midland Ave., Detroit 3, Mich. Designated as the De-Sta-Co Model No. 610, the clamp can be quickly converted from "push" and "pull" action, or vice versa, simply by relocating one of the handle bolts.

Weighing 1½ lb. and with an overall length of 6¾ inches, the Model No. 610 clamp has a plunger rod travel of 1½ inches. The rod is tapped to accommodate a ⅜-inch 16-thread standard bolt, providing for quick adjustment to the work being handled. The clamp features a silvery-toned rust-resistant plated finish.



De-Sta-Co Model No. 610 "Push-and-Pull" Lock Clamp

Palmer-Shile Welder's Truck

For the acetylene gas welder who must take his equipment to the place of welding, the Palmer-Shile Co., 786 S.

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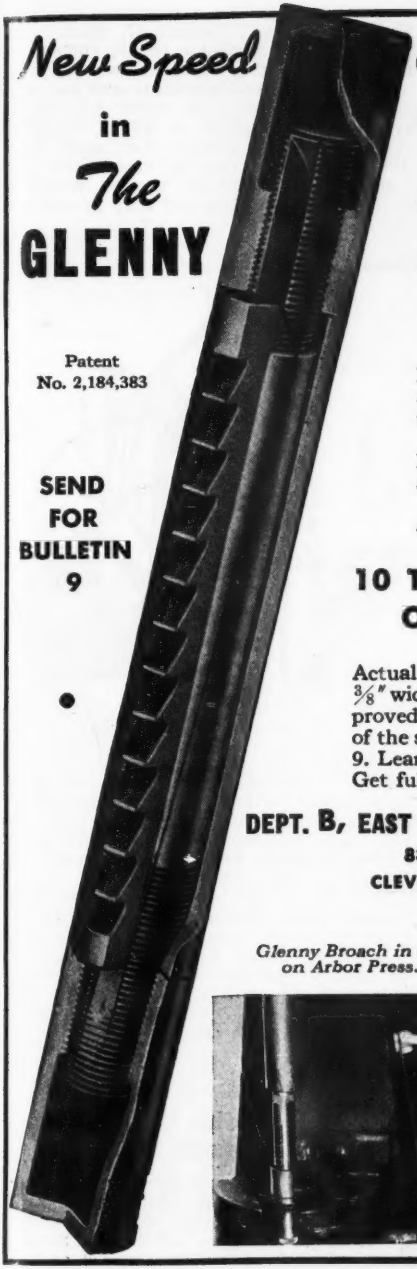
New Speed *and Accuracy*

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The **GLENNY**

Patent
No. 2,184,383

SEND FOR BULLETIN 9



KEYWAY BROACHING

Adjustable-Expansion

Push **BROACH**

MAINTAINS ± .0005 ACCURACY IN EVERY PIECE BROACHED

Broaches slots of greatest accuracy to an average length of four inches and up to $\frac{5}{8}$" widths.

May be used on an Arbor Press, Lathe, Screw Machine and other standard equipment.

Has many valuable uses in shop and factory.

10 TIMES FASTER THAN BY ORDINARY METHODS

Actual tests in cutting keyways $\frac{3}{16}$" deep, $\frac{3}{8}$" wide, $1\frac{1}{2}$" I. D. 3" long, in a steel bushing proved ten times faster than by the handling of the same job on a shaper. Send for Bulletin 9. Learn more of this and similar operations. Get full information on the Broach.

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Glenny Broach in use on Arbor Press.

Glenny Broach in use on Turret Lathe in series with other operations.



NEW METRO-VISE
POSITIONER
(TWO TOOLS IN ONE)



for MOUNTING YOUR VISE, FIXTURE
or used as
ANGLE PLATE

Holds or mounts work rigidly, for checking, milling, drilling, shaping, grinding, boring, welding and pattern making.

Quick, accurate adjustment to any desired angle, set with protractor. Easy to use. Three standard sizes. Send for literature and prices.

Desirable territory still open for live representative.

METRO-VISE CO.
274 STEPHENSON BLDG.
DETROIT 2, MICHIGAN

Harrington Ave., Detroit 17, Mich., has provided the welder's truck shown in the accompanying illustration.

Designed to accommodate one gas and one air cylinder, the truck serves to cradle the cylinders so as to stabilize them and thus provide for easy handling. The handles of the truck are equipped with a cross bar on which a Gasaver or torch hanger may be readily



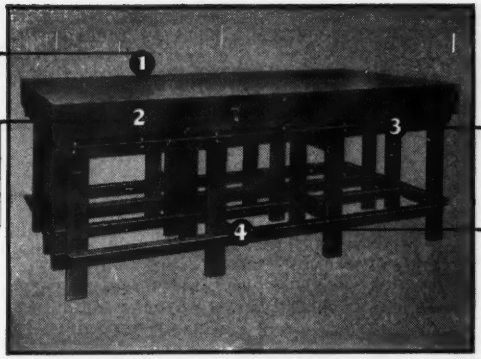
Palmer-Shile Welder's Truck

mounted. Hooks welded onto the handles afford convenient means for hanging gas hose when not in use. A toolbox, also fastened to the handles, is swivel mounted so that tools are always held in a level position.

The Palmer-Shile Welder's Truck is of all-metal all-welded construction. The framework consists of angle iron and sheet metal, and the handles are of heavy tubular steel. The truck measures 48 inches high overall and 29 inches wide overall. The wheels are 24x2 inches in size.

Zephyr Flexible Shaft Angle Drill

The Zephyr Manufacturing Co., Inglewood, Calif., is now offering a flexible shaft angle drill in 45, 90, and 360-deg. angle types with 18 or 30-inch flexible shafts. The flexible shafts alone can also



Special analysis semi-steel planer finish or precision ground.

Six inches deep, heavy, ribbed construction.

Lock-leveling screws permit quick leveling and locking.

Sturdy, multiple legged, arc-welded steel stand.

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LAYOUT SURFACE PLATES

"THE KIND THAT STAY PUT"

Speed Up Production

They present a true, rigid, smooth surface for inspection and for the insurance of repeated accuracy in assemblies and layouts. Deep heavy ribs and extra heavy stand prevent sagging or yielding under load. Built for many years of accurate performance.

Standard plates are 6 inches thick—8 inch plates made on special order. Size from 12x18 inches to 54x144 inches. On special order, plates will be grooved and keyed so that two or more can be assembled and mounted into one complete unit. Specially grooved or machined tee-slot surfaces for specific assembly or checking operations made on special order.

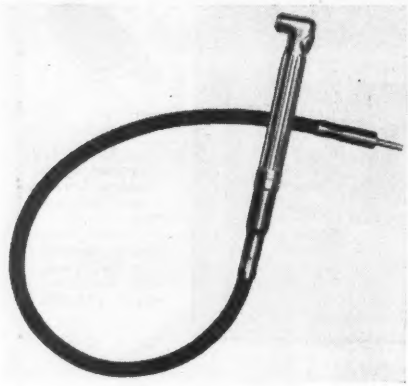
Sold with or without the rugged, all-steel, arc-welded stand with lock-leveling screws. Write today for detail information ● ● ●

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THE CHALLENGE MACHINERY CO.

MAIN OFFICE AND FACTORY:

GRAND HAVEN — MICHIGAN



Zephyr Flexible Shaft Angle Drill

be supplied for coupling to other angle drills or with threaded spindles for direct use without an angle drill.

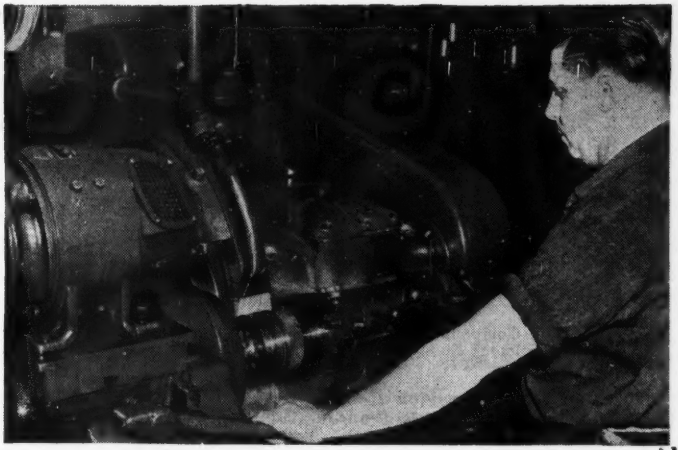
The flexible shaft of the Zephyr Angle Drill includes a piano wire stress-relieved core which is encased in oil-resistant rubber and fitted with oilless-type bronze bearings. The drill head is precision made to close standards with heavy duty double gears and non-friction ball and needle bearings to provide for long trouble-free service.

Pope Precision Compensating Live Center Tailstock Spindle

A live center tailstock spindle which is designed to provide automatic compensation for heat expansion of work held between centers is announced by the Pope Machinery Corp., Haverhill, Mass. According to the manufacturer, the spindle successfully provides for axial movement to take care of work expansion without losing any of the accurate centering support furnished by the preloaded radial bearings.

The spindle is mounted on oversize precision bearings which are properly preloaded and have sufficient capacity for radial loads. The end thrust is taken on a separate set of preloaded thrust bearings which are mounted in a manner that allows for work expansion without building up excessive pressure on the bearings.





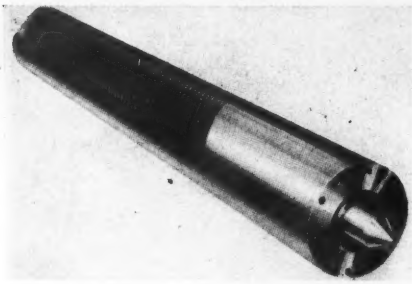
NORTON 10" x 18" CYLINDRICAL GRINDING MACHINE finish-groove grinding cylindrical roller bearing outer races—4" O.D., rate 27 per hour
Courtesy SKF Industries, Inc.

The properties of Economy Grinding Lubricants which produce these excellent results on finish-groove grinding roller bearing outer races are equally valuable to any company with a grinding job to do. Even the toughest work can be handled at economy-promoting speeds, and with unusually long wheel life.

Ground parts which must carry heavy loads are produced better with Economy Grinding Lubricant. Because Economy Grinding Lubricant provides easier stock removal there is less disturbance of metal structure. This means higher load carrying capacity.

Follow the example of leading metal working manufacturers and submit your grinding problems to The White & Bagley Company. Catalog G 16 gives all the facts. It's yours for the asking.

THE WHITE & BAGLEY COMPANY
WORCESTER, MASS. Detroit, Minneapolis



Pope Precision Compensating Live Center Tailstock Spindle

With the Pope Precision Compensating Live Center Tailstock Spindle, the operator has only to set up the work and adjust the center, no further spindle adjustment being required. The spindle features sealed lubrication to assure uniform trouble-free operation for the life of the bearings.

The Pope Tailstock Spindle illustrated herewith is 53 inches long by 6½ inches in diameter and is intended for use in a production engine lathe. Its center is readily removable without disturbing the bearings. This spindle is said to be capable of supporting workpieces weighing 10 tons or more. Centers for lathes of other sizes are also available with the automatic compensation feature.

Ideal Lever Type Cable and Wire Stripper

A lever type stripping device for removing rubber, asbestos, synthetic, plastic, glass, cambric, and other insulations from cable and wire is announced by the Ideal Commutator Dresser Co., 1031 Park Ave., Sycamore, Ill. Any length of wire or cable up to ⅝ inch in diameter—single or parallel conductor—can be stripped. Plain or grooved blades are used, depending upon the type of wire. Parallel wire, heater cord, inner conductors, and P. O. S. J. cord can be stripped with plain blades. The grooved blades are intended for rubber-covered and weatherproof cable.

To use the stripper, the wire is simply laid in position between the jaws

Almond DRILL CHUCKS

• • SINCE 1872 • •



● The Almond Three Jaw Drill Chucks were the first to be placed on the market. They were Pioneers in the field of Drill Chucks!

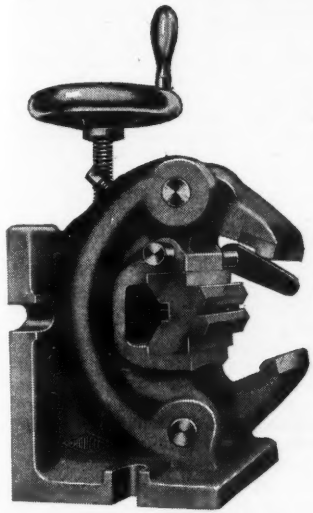
ALMOND THREE JAW DRILL CHUCKS are furnished in 9 sizes with capacities from 3/16" to 1". These are made in heavy and light duty types with a taper arbor hole or with a threaded arbor hole. For Portable Drills.

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T. R. ALMOND MFG. CO.
ASHBURNHAM • MASSACHUSETTS

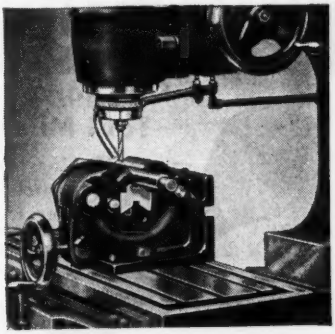
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SELF-CENTERING SHAFT VISE



One Vise that every shop needs

You will find a hundred uses for this powerful, time-saving vise. It holds shafts or spindles — any diameter from 3/8" to 3 1/8" — accurately in position for machining slots, splines or keyways. Accurate radial cuts are assured by the unchanged setting for all work-diameters. Shafts are always correctly located in V jaw by equal movement of the two clamp-jaws.



Can be mounted horizontally or vertically. V jaw is hardened and reversible. Base size 8" x 7 1/4". Weight, approximately 80 lbs.

Write for the Producto Vise Bulletin, "Tools Every Shop Needs".

THE PRODUCTO MACHINE COMPANY

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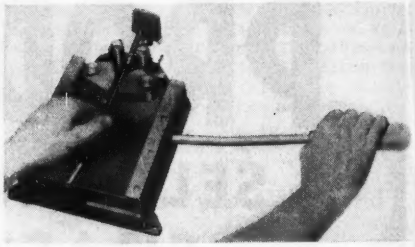
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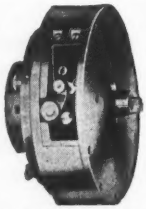
NEW YORK, 197 LAFAYETTE STREET

and cutter blades and the handle of the unit pulled, thus causing the jaws to grip the wire and draw it through the oscillating blades. The pulling action is in a straight line, thereby eliminating scrapping and nicking of the wire. The jaws are arranged to automatically center and grip any diameter of wire within their capacity without manual adjustment and instantly release the wire at the completion of the stripping stroke. The blades open automatically to receive the wire when the operating lever is moved forward. An adjustable stop for determining the length of wire to be stripped is provided on the unit. When extra long stripping is desired the stop can be removed.

The blades of the Ideal Lever Type Cable and Wire Stripper are quickly interchangeable. The grooved blades are available in 15 standard sizes.



Ideal Lever Type Cable and Wire Stripper



M-D Facing Heads

With Automatic Feed

Can be attached to Boring Mill Bar, and Drilling or Milling Machine spindles. Single point tool travels radially, from center outward or reverse, feeds automatically. Sizes 6" to 46" diameter.

Write for circular.

MUMMERT-DIXON CO.

120 PHILADELPHIA ST. HANOVER, PA.

"Air-Tru" Flat Ground Stock

Simonds Worden White Co., Dayton, Ohio, announces the development of a non-deforming flat ground stock, to be known as "Air-Tru," for use in the construction of accurate jigs, gages, fixtures, tools, punch and die facings, and small precision parts. Designed to maintain close tolerances through heat treating, the metal is available in all standard stock sizes.

Sheffield Powered Crush Dressing Device

The Sheffield Corp., Dayton 1, Ohio, announces the development of a powered crush dressing device for use with

UTICA TOOLS

For More Tool Mileage



THE Finest Pliers and Wrenches for lasting service.

The choice of good mechanics everywhere.

U TI CA

UTICA DROP FORGE AND TOOL CORPORATION

UTICA, N. Y.



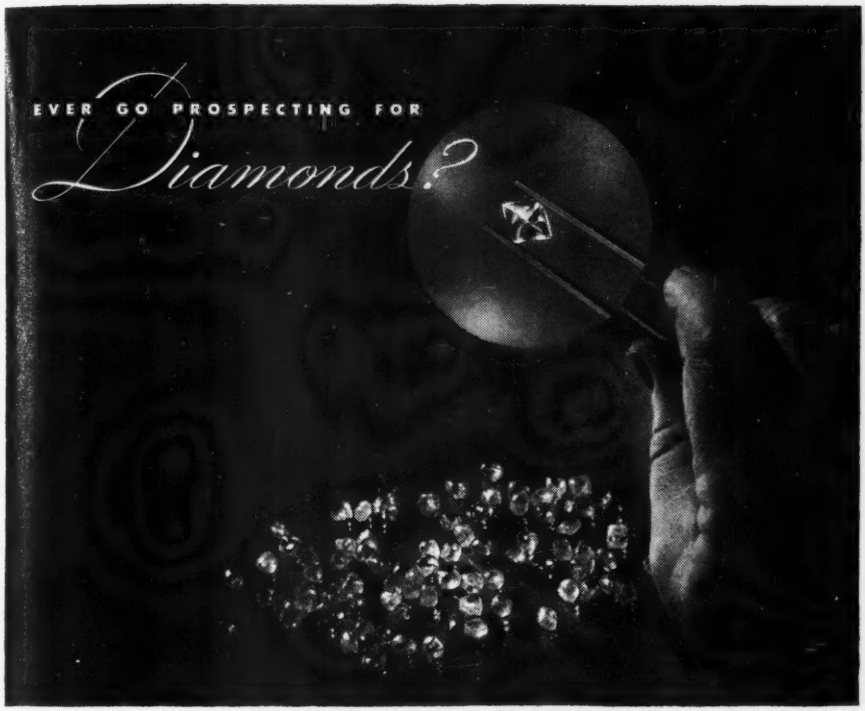
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BY A QUICK, EASY, INEXPENSIVE METHOD

Your business letterhead will bring literature.

WATTS BROS. TOOL WORKS

Wilmerding, Pa.



Do you like to spread out a package of diamonds and sort them over, looking at size and shape and structure and color, finding the stones with the twisted, knotty grain that stands up so well on the tough jobs, mentally marking the big rugged fellows for the big, coarse-grained wheels, smaller stones for the finer wheels, special shapes for this tool or that?

That's how experienced diamond buyers—production men, purchasing agents and heads of grinding departments—have been buying Wheel Trueing diamonds for more than a third of a century although, in many instances, we have come to know their requirements so well that they leave the matter of selection entirely in our hands.

Our sales offices throughout the country can get diamond assortments to you quickly for your inspection and selection—and can give you equally efficient service in supplying any type of diamond tool—standard or special—which you may require.

Your inquiry will receive prompt attention.

Send for a copy of our booklet, "Tips on Using Diamond Tools." You'll want copies for all your operators.

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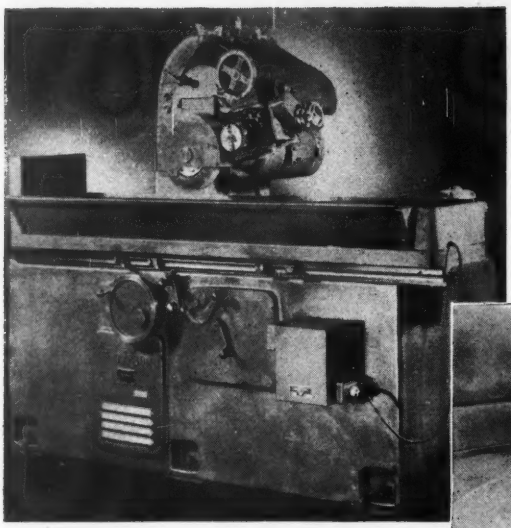


Fig. 1—Sheffield Powered Crush Dressing Device Mounted on Thompson Surface Grinder

the Thompson Model "B" surface grinder. The device is designed for mounting on the wheel head slide of the machine as illustrated in Fig. 1. A ½ h.p. gear head motor (not shown) is directly coupled to a grinding wheel spindle at the rear of the housing and drives the wheel at crushing speed through an over-running clutch which is thrown out of engagement during actual grinding.

An outstanding feature of the Sheffield Powered Crush Dressing Device is the arrangement whereby the crusher is fed into the wheel by means of an electric motor which turns the micrometer in-feed screw at a constant rate. A close-up view of the dressing device and electric motor is shown in Fig. 2.



Fig. 2—Close-up view of Sheffield Powered Crush Dressing Device, including electric motor for feeding the crusher into the wheel.

The Sheffield Powered Crush Dressing Device is available in two models. The Model "B" is semi-automatic with the feed dial indicator preset for a desired depth of automatic in-feed of the crusher roll. With the Model "A", the operator controls the device by pressing a push button and releasing the pressure when the feed indicator dial shows that the desired depth has been reached.

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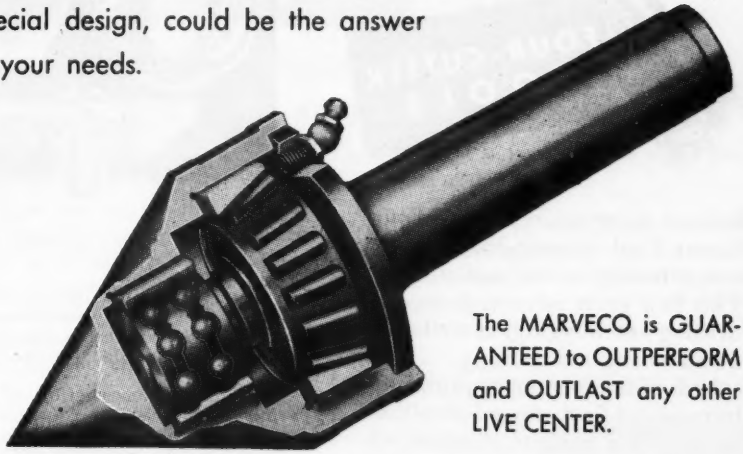
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Simmons Spring Lock Fastener

Requiring no nuts or receptacles, a one-piece fastener designated as the Spring Lock has been developed by the Simmons Fastener Division of Simmons Machine Tool Corp., North Broadway, Albany 1, New York. The fastener is self-adjusting to compensate for various material thicknesses within its range and



Simmons Spring Lock Fastener

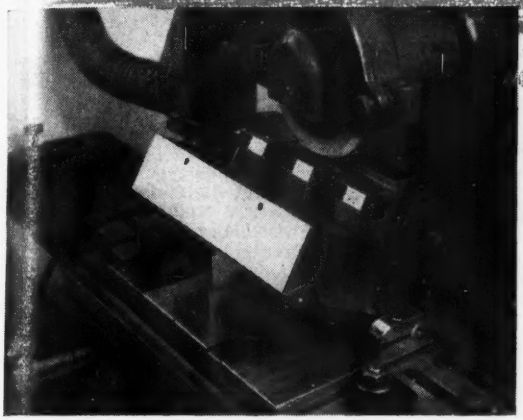
can be locked or unlocked by means of a quarter turn of a screw driver in a 90-deg. clockwise direction. It can also be permanently installed for use as a blind rivet.

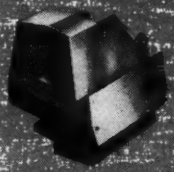
The unique construction of the head permits one-direction rotation for locking or unlocking the fastener. A quarter turn of the head puts the initial twist in the spring and another quarter turn locks the fastener in place. The spring pressure pulls the sheets together, providing a vibration-proof installation without deflection of the work, it is claimed.

Truform Gear Cutters

The Truform Cutter Co., 3224 Drew St., Los Angeles 41, Calif., is now marketing a line of small fine pitch gear cutters which are said to be especially useful to the laboratory or shop engaged in experimental or small lot production work. The

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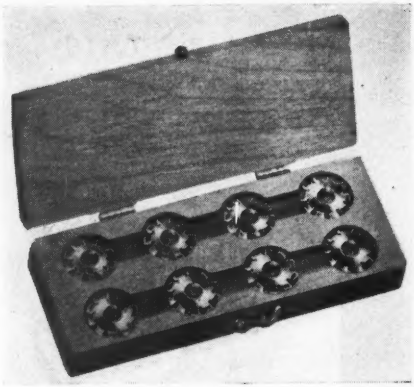
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Truform Gear Cutters

cutters are ¾ inch O. D. and are provided with ¼-inch arbor holes.

The line includes gear cutters in 48, 64, 80, and 96 diametral pitches and with 14½-degree pressure angles. Available in either carbon or high speed steel, the cutters can be supplied in sets of 8 to cut gears from 12 teeth to rack in any of the above pitches. Special cutters in pitches finer than 48 can be made to order. Twenty-degree instrument type gear cutters and epicycloidal cutters can also be obtained on special order.

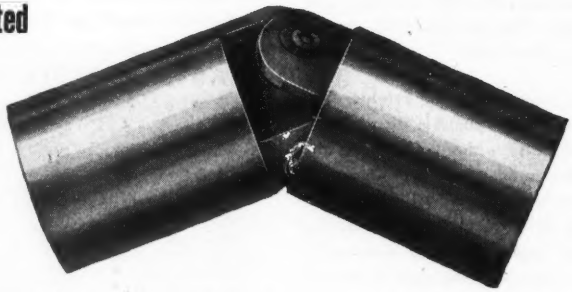
Reed-Prentice 22V Vertical Miller

A heavy duty knee-type unit designed for toolroom and die-sinking work, the Reed-Prentice 22V Vertical Miller illustrated herewith has been brought out by the Reed-Prentice Corp., Worcester 4, Mass. The spindle head includes a tilting arrangement which allows for milling at all angles within 45 degrees front and back and within 30 degrees left and right of vertical. The head and transmission are mounted on a sliding ram to increse operating range.

The spindle is driven by a 3 h.p., 1,800 r.p.m., a.c. motor. Although this is a constant speed motor, infinitely variable spindle speeds between approximately 90 and 2,200 r.p.m. are obtainable by means of a Reeves drive. This drive is push-

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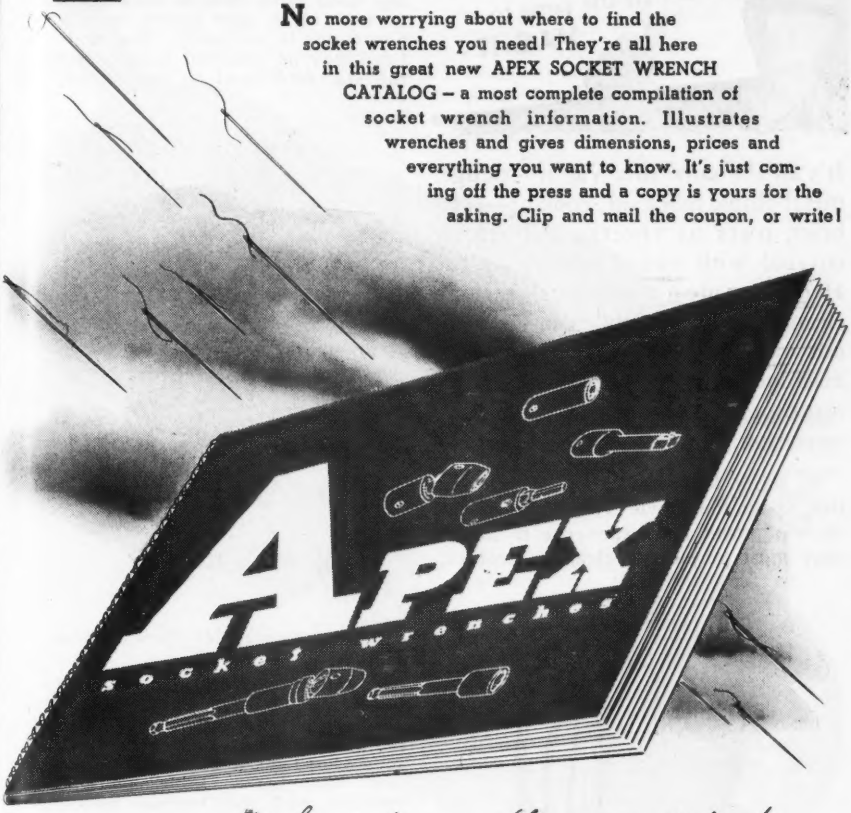
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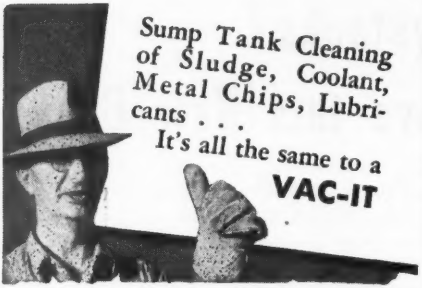
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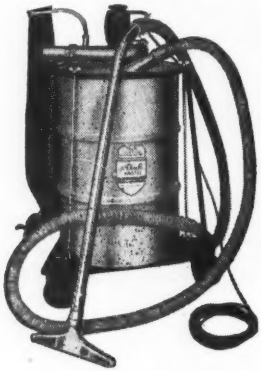
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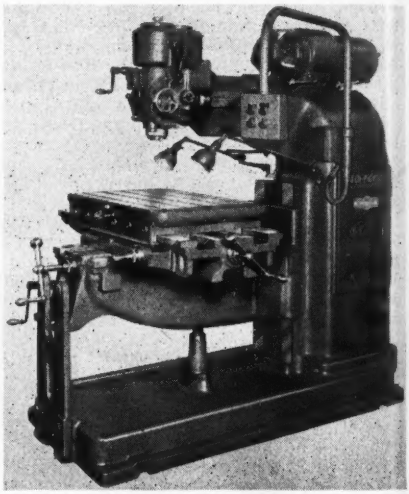


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button remote controlled, and, thus, the operator has finger-tip control over the spindle speed and is able to make speed adjustments while the cutter is in operation. A spindle speed indicator, graduated in r.p.m., is mounted on the transmission. An auxiliary high speed drilling head with spindle speeds from 410 to 6,450 r.p.m. and driven by a ½ h.p., a.c. motor is available. The high speed head may be installed without removing the standard head by simple swiveling



Reed-Prentice 22V Vertical Miller

the latter from the high-hand to the left-hand side of the ram.

The table and saddle are mounted on rollers operating on hardened steel ways, thus allowing for effortless hand operation with heavy table loads. Cross, vertical, and longitudinal feed screws are equipped with mircrometer dials graduated in thousandths of an inch. The table has a working surface of 32x22 inches and is 4 inches thick. The vertical feed screw of the knee is hand operated and has a 16-inch travel. The longitudinal and cross feed screws have a range of 27 and 20 inches respectively and are power driven by one variable speed electronic unit.

The electronic feed drive provides a feed range of from less than ½ inch to over 40 inches per minute; is powered by a 1 h.p., 1,800 r.p.m. d.c motor; provides constant torque; is of the half-

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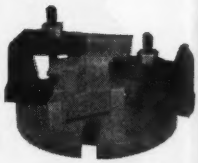
wave rectification type; and is equipped with a dynamic braking arrangement for rapid deceleration. A clutch and two levers are provided for throwing the power drive on either the longitudinal or cross feed and for selecting the direction of feed. Reversing and stopping are accomplished by mechanical means. Feed speed adjustments can be made while the machine is in operation by simply moving a potentiometer knob.

The centralized push-button control station of the unit is mounted on a rigid pendant arm having a 90-degree swing. All controlling means are mounted on this station. The magnetic control panel and the electronic unit are mounted inside the column in dust-compartments.

Specifications of the Reed-Prentice 22V Vertical Miller are as follows: longitudinal feed (hand or electronic power), 27 inches; cross feed (hand or electronic power), 20 inches; vertical feed of knee (hand), 16 inches; horizontal ram adjustment (hand), 16 inches; table dimensions, 32 inches long x 22 inches wide x 4 inches thick; spindle speeds, 90 to 2,200 r.p.m; taper hole in spindle, No. 40 N.M.T.B.A.; throat depth with ram fully extended, 30 inches; electronic power cross or longitudinal feeds, ½ to 40 inches per minute; weight with power feed, 6,750 lb.; weight without power feed, 6,500 pounds.

Johnson Adjustable Work Clamp

An all-purpose adjustable work clamp for lathes, milling machines, drill presses, and many other machines has been placed on the market by the Johnson & Tierney Co., P. O. Box 256, Pequannock, N. J. Designed for speedy, accurate setup and operating ease the clamp is constructed to hold a wide variety of work which is flat on the bottom, regardless of peripheral contour. The vise-like parallel clamping action afforded by the unit provides for the firm holding of workpieces. For production runs, the clamp base may be bolted to the

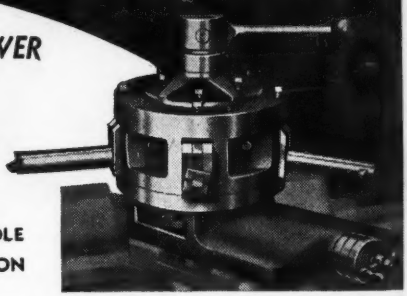


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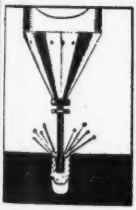
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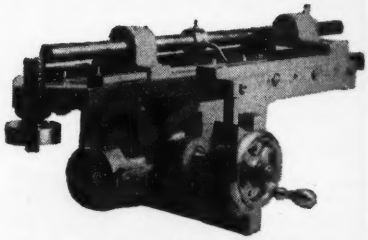
faceplate or table of the machine.

The Johnson Adjustable Work Clamp can be obtained with a ⅜-inch T-bolt, providing a capacity of ½ to 2 inches from the table or plate; and ⅝ inch T-bolt, providing a capacity of ½ to 4½ inches from the table or plate.

Reeve Taper and Profiling Attachment

An attachment which is designed to greatly simplify the boring of tapers and profile holes using turret lathes or hand screw machines has been placed on the market by the Artisan Tool & Cutter Co., 531 Vester St., Ferndale 20, Mich. Designated as the Reeve, the attachment can, it is claimed, be set so precisely as to eliminate entirely the trial-and-error method of producing the correct taper. According to the manufacturer, the size and taper at the face of the stock are held the same from piece to piece regardless of variations in the length of the stock.

Designed for quickly setting to any required diameter and taper, the Reeve Attachment can be used in boring either



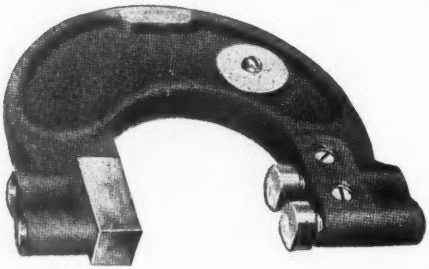
Reeve Taper and Profiling Attachment

tapered or straight holes without making any change in the setup except for moving back the top slide. The attachment can be readily installed on hand screw machines or turret lathes without interfering with other tools in the turrets, and is also adaptable to some chucking machines.

Stanley No. 214 Unishear

Light in weight and easy to operate, the Stanley No. 214 Unishear illustrated herewith, product of Stanley Electric

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Tools, Division of The Stanley Works, New Britain, Conn., is designed to cut 14 gauge hot rolled steel and other sheet materials in proportion. According to



Stanley No. 214 Unishear in Use

the manufacturer, the unit incorporates a simple, improved blade motion that "feeds in" the work so that little effort is required by the operator to cut straight lines, curves, angles, and notches accurately and without distortion of material. Blades can be removed easily for resharpening and as easily and quickly replaced.

The design of the Stanley No. 214 Unishear includes a minimum number of moving parts. Additional features of the unit include a duplex handle which permits the operator to grip the tool in a position most convenient for use; slide-operated switch conveniently located in the handle; full ball and roller bearing construction; and alloy steel yoke. The unit can be obtained with a 115, 220, 230, or 250-volt universal type motor for operation on either alternating or direct current.

Industrial Laboratory Oven

A streamline, compact, and completely self-contained oven for laboratory and pilot plant use has been designed by the Industrial Oven Engineering Co., 11621 Detroit Ave., Cleveland 2, Ohio. The oven is available in sizes having working spaces ranging from 3x3x3 feet to 6x6x6 feet in increments of 1 foot. Special sizes can be furnished to specification. Temperatures range up to 900 deg. F., with a guaranteed differential of ± 2 degrees.

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Model C was designed to meet the demand of faster machining and accurate indexing of small pieces on bench and hand milling machines.

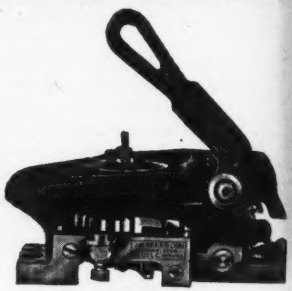
SPECIFICATIONS:

	Model B	Model C
Height to top of collet	5⅝"	3½"
Center of collet to back of fixture	3¼"	2"
Collet capacity	1" round	⅝" round
Cuts per hour on free machining material	1000	1500

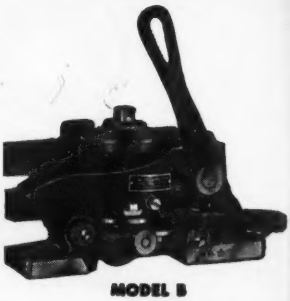
Work held by automatically opening and closing collets. Work automatically ejected. Indexes without loss of time for milling 1, 2, 3, 4, 6, 8, 12 or 24 sided pieces.

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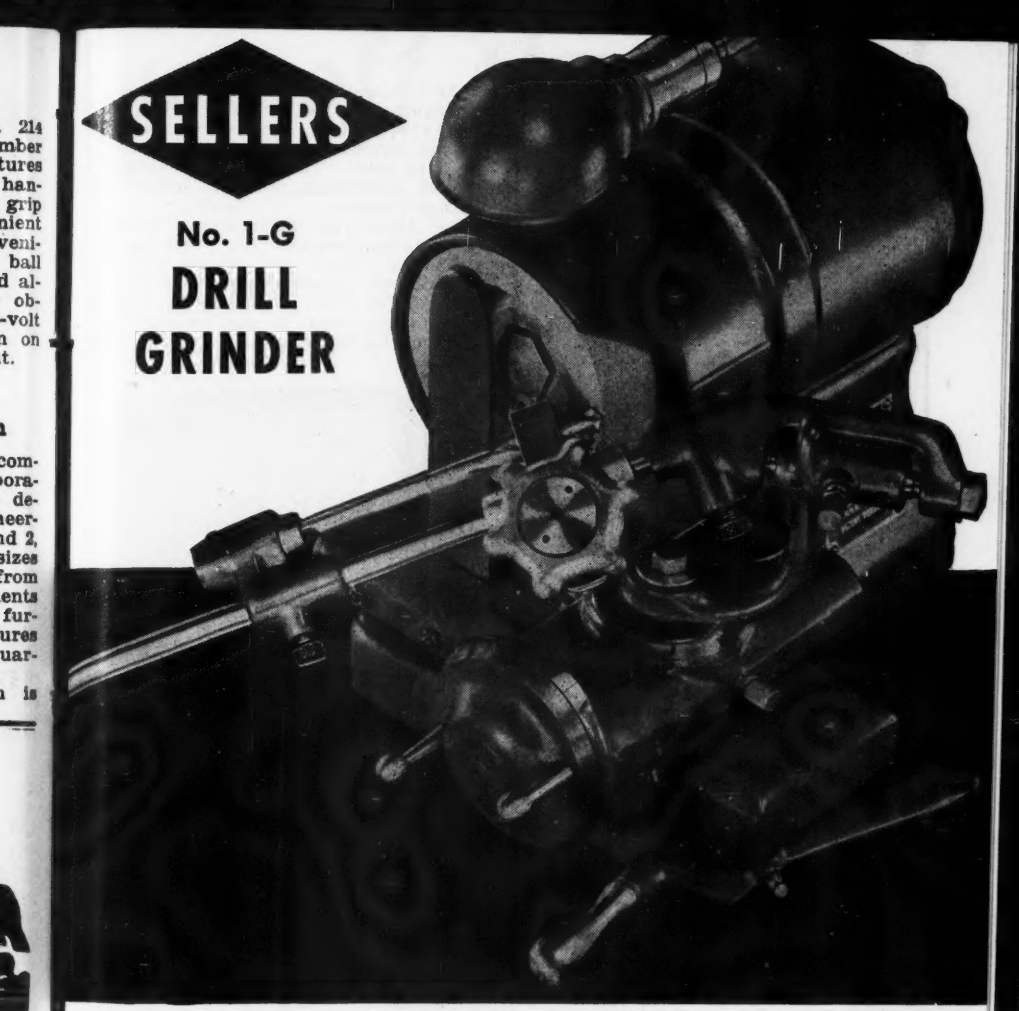
J.W. DEARBORN ANSONIA, CONN.



MODEL C



MODEL B



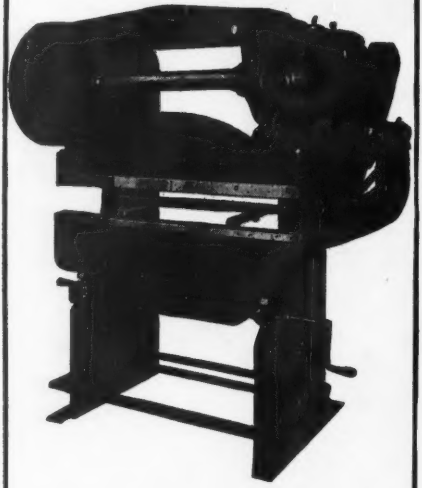
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And it takes but a few hours for a green-horn to become an expert on this modern machine shop tool. Once set for the angle and clearance you require, it automatically produces a steady flow of perfectly pointed drills—each exactly like the other. Speeds drilling time: reduces drilling costs: reclaims broken drills. Type 1-G takes drills from .028" (#70) up to ½" dia. Other models have capacities up to 3" dia. *Write today for complete data and prices.*

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The No. 253 CHICAGO STEEL PRESS is accurate, compact, and ruggedly constructed of highest quality materials. Sizes 4, 5 and 6 ft. capacities up to 10 gauge.

Write for Circular No. 255

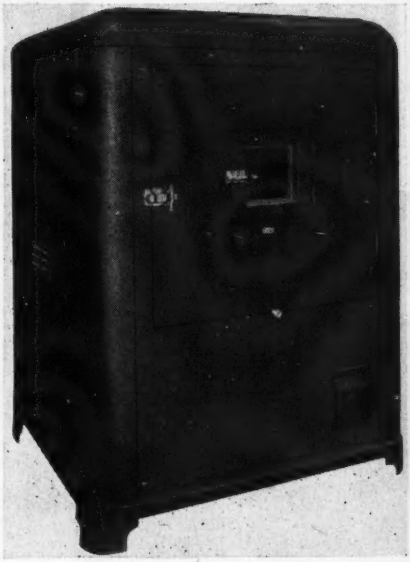
DREIS & KRUMP MFG. Company

7418 LOOMIS BLVD.

CHICAGO 36 ILLINOIS

usually furnished with electrical heating equipment but is designed to use any type of fuel. In every case, the heating equipment is contained within the oven shell. The smaller models are shipped assembled, ready to connect to the heat source.

The Industrial Laboratory Oven is particularly designed for precision experimental work in drying, baking, evaporating, polymerizing, and so on, especially in cases where highly volatile solvents are used. It can be furnished with special construction to withstand



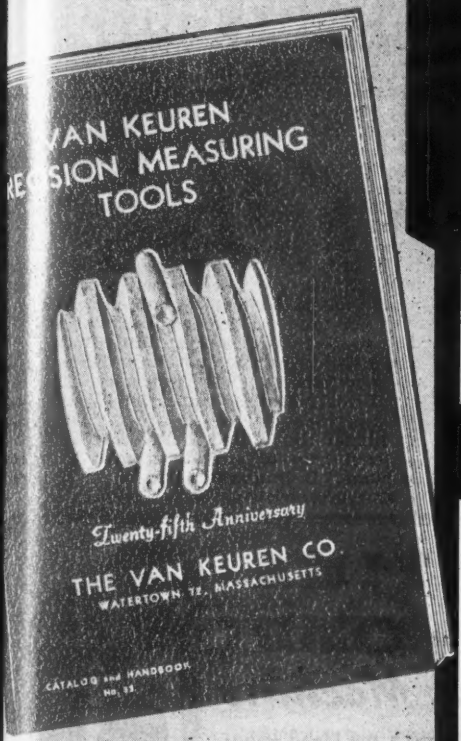
Industrial Laboratory Oven

corrosive fumes and is available with exterior baked enamel finishes in a variety of colors to harmonize with surroundings. Automatic temperature controls are provided to suit the processes for which the oven is used.

PRCo Type CP Roughness Meter

Of particular use in controlling the surface finish of high explosive large caliber shells, the PRCo Type CP Roughness Meter illustrated herewith has been placed on the market by the Physicists Research Co., Department 6, Ann Arbor, Mich.

Just off the Press!



The NEW VAN KEUREN HANDBOOK No. 33

This new 160 page Catalog and Handbook is a highly useful manual in convenient reference form on precision measuring. It describes and illustrates methods and equipment for checking accuracy to hundred thousandths and millionths of an inch. Use of the Van Keuren equipment described in this new booklet has resulted in many outstanding improvements in production and product quality and in vastly simplifying the problem of attaining closest tolerances on work of all kinds.

Partial List of Contents

NEW PRODUCTS

New Light Wave Equipment with fused quartz optical flats.
New solid square master blocks representing permanent accuracy.
New and complete gear measuring tables from 5 to 500 teeth.
New Type L Monochromatic Light.

ENGINEERING INFORMATION

How to measure standard and special screw threads.
Screw thread data including tables of basic diameters and tap drill sizes for all American threads.
Thread proportions for American and Foreign threads.
Bureau of Standards measuring wire specifications.
How to measure helical gears.
How to measure angles.
How to use optical flats.
Notes on gaging holes.

Mail Coupon
TODAY!

THE *Van Keuren* CO., 175 WALTHAM ST.
WATERTOWN 72, MASS.

25th Anniversary Ultimate Accuracy

THE VAN KEUREN CO., 175 Waltham Street, WATERTOWN 72, MASS.

Kindly send me a copy of your NEW Catalog No. 33. It is understood this request incurs no obligation on my part.

Name.....

Position.....

Company.....

Address.....



PRCo Type CP Roughness Meter in Use

Readings of the meter are in microinches of average roughness of the surface being measured. The meter and scale selector provide full scale ranges of 300, 1,000, and 3,000 microinches.

The tracer is designed for hand operation and is ruggedly constructed for use on rough surfaces. For tracing the surface, the tracer includes a blunt diamond point which is automatically self-adjusting to practically any curvature.

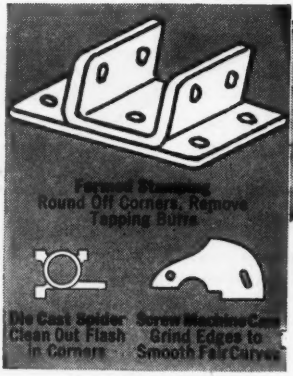
EutecTrode 28 Welding Rod

Designated as the EutecTrode 28, a coated special bronze alloy welding rod for use in the arc welding of bronze, brass, and copper is announced by the Eutectic Welding Alloys Co., Dept. A-2, 40 Worth St., New York 13, N. Y. The rod comprises an unusual combination of metals and is shielded with a newly devised flux coating that makes it suitable for use either on A.C. or D.C.

According to the manufacturer, the EutecTrode 28 will deposit dense and tough metal that is a good color match to most types of bronzes and will afford the welded area substantially the same corrosion resistance as the various base metals possess. The rod may also be used for welding copper and brass or joining these metals to steel, cast iron, or nickel alloys, and for overlaying steel or cast iron to provide a good bearing surface. It is available in $\frac{1}{8}$ or $\frac{3}{16}$-inch diameters.

18 WAYS TO SAVE TIME & MONEY with the MEAD Industrial Burring Machine

New circular explains, illustrates 18 ways in which the Mead Industrial Burring Machine saves time and money—also contains special Grit Guide. Every industrial plant needs this "Jack-Of-All-Trades" machine. Your burring can be done in "free time"—install these machines by every machine tool which leaves burrs. Grinds, finishes both outside and inside cut-out openings. Immediate delivery in most cases. Write for the informative Money-Saving circular now.



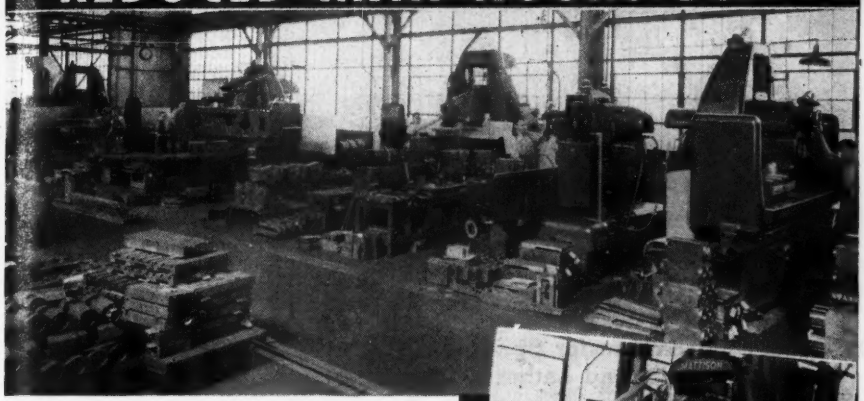


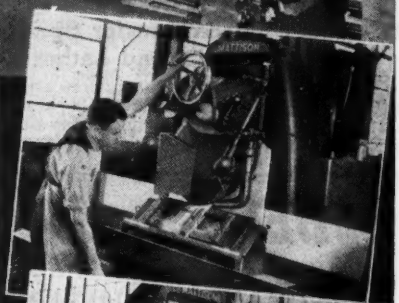
Mead Specialties Co.

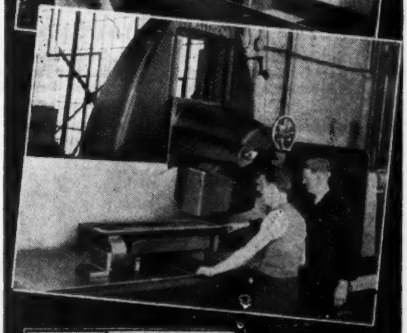
4114 North Knox Ave.
Dept. A-75
CHICAGO 41, ILL.

For METAL—PLASTIC—WOOD

GRINDING INSTEAD OF SCRAPING REDUCED MAN HOURS 75%



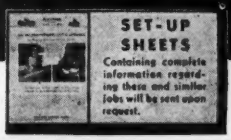




The policy of "grinding instead of hand scraping wherever possible" has resulted in a 75% saving of man hours for a prominent Detroit Manufacturer. Because of this saving, 80 out of 125 employees in the Scraping Department were released for important service elsewhere in the plant. This is mighty important now when every minute, every hour and every man counts.

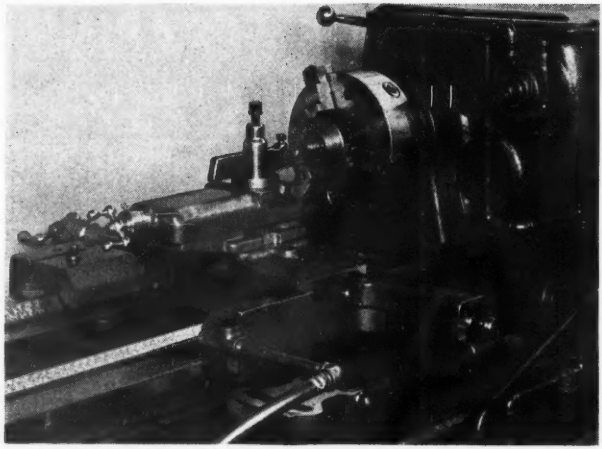
Jobs are being routed through these Mattison Grinders that were previously thought impossible to grind. Special fixtures permit the handling of jobs, such as shown in close-up views, at a considerable time saving. Parts with angular or hardened steel ways are also ground to closest accuracy and fine finish.

Grinding instead of scraping, means time saved and faster production, which in turn, results in a saving of man hours. This is a mighty important point that warrants your careful consideration. Write for complete details on the Mattison High-Powered Precision Surface Grinder and free set-up book showing further example of the capabilities of this machine.



MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS



Springfield Geared Head Lathe equipped with reversing mechanism for performing intricate threading job

Reversing Mechanism for Springfield Geared Head Lathe

The accompanying illustration shows a Springfield Geared Head Lathe adapted for performing an intricate threading job. The workpiece consists of a coarse lead stem with thread on same running back under a protecting shelf and ending at this point, with no relief allowed for clearance.

The machine is equipped with a reversing mechanism, which is arranged to withdraw the cutting tool at the same point and to reset the tool for the next oncoming cut. More explicitly, the arrangement provides for the withdrawal of the tool and, as the carriage is run back to the starting point by means of the reversing mechanism, a dog located on the back side of the mechanism resets the tool in the cutting position. In this manner, work can be accurately

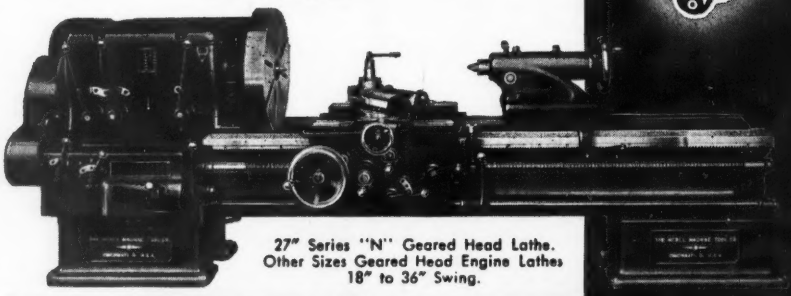
NEBEL Geared Head Lathes

A MODERN LATHE. ALL THE LATEST IMPROVEMENTS.

Timken Bearings
Self Oiling Headstock
Chrome Nickel Shafts
Quick Change Gear
Double Wall Self Oiling Apron
Quick Action Apron Levers
Thread Chasing Dial

We also manufacture a line of Removable Block and Extension Bed Gap Lathes. Write for circulars.

NEBEL LATHES

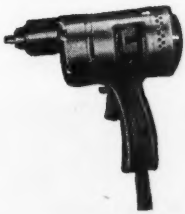


27" Series "N" Geared Head Lathe.
Other Sizes Geared Head Engine Lathes
18" to 36" Swing.

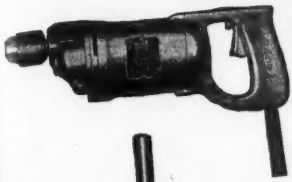
The Nebel Machine Tool Co.
CINCINNATI OHIO



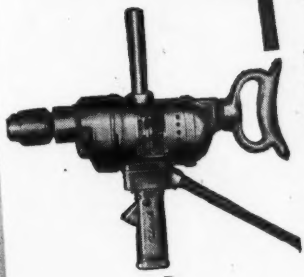
Clark "Ace" 1/4" Ball Bearing Drill is exceptionally light in weight and very easy to handle—yet has the power of larger tools.



Clark 1/4" High Production Ball Bearing Drill (side handle type) is specifically built to fit either the horizontal or vertical drilling position.



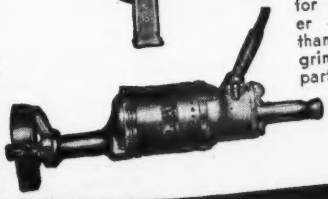
Clark 1/4" Heavy Duty Ball Bearing Drill is designed for use wherever light weight, speed and continuous operation at minimum upkeep are requirements.



Clark 1/2" Heavy Duty Ball Bearing Drill is designed for continued heavy duty and long service at a minimum upkeep.



Clark 3/4" Heavy Duty Ball Bearing Drill is built especially for contractors, car and locomotive shops and heavy duty auto repair shops.



Clark 6" Ball Bearing Aerial Grinder is built for greater power and capacity than most other grinders of this particular type.

You'll get more hours of CONTINUOUS PERFORMANCE from a *Clark* electric tool

War production demands speed . . . stamina . . . and continuous performance . . . in electric tools. Clark tools have provided all these production requirements . . . and, in many plants, have broken all previous performance records. The reason why Clark tools perform longer is this: every step in making these electric tools—from blueprint to final test—is executed at the Clark plant. By controlled-construction methods the many parts of a Clark tool are thus integrated into a better-balanced, better performing unit. Buy Clark and you buy a finer-built electric tool . . . trouble-free operation . . . and more hours of continuous performance.

Clark

drills • grinders • sanders

JAMES CLARK, JR., ELECTRIC COMPANY, 620 [illegible]

THE Right MACHINE THE Right FIXTURE

AIR CONTROL is the Secret of precision tapping The Haskins Way

Accuracy—to a class 4 fit when necessary—is constant—each part is tapped exactly like every other, independent of operator efficiency. AIR regulates the complete tapping cycle—not only the down stroke, but its control is so sensitive that the tap is allowed, in effect, to float out of the part. Tap life is longer—tap breakage practically eliminated. Send today for your copy of catalog on Tapping—The Haskins Way. R. G. Haskins Co., 620 So. California Ave., Chicago, Illinois.

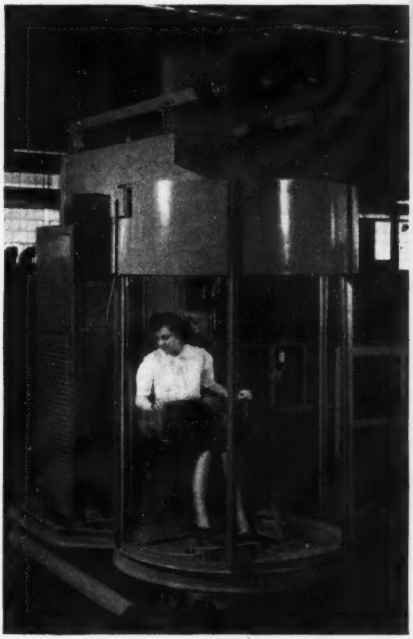


HASKINS haskins PRECISION TAPPING EQUIPMENT

threaded on a high speed production basis. The Springfield Geared Head Lathe and reversing mechanism shown are products of The Springfield Machine Tool Co., Springfield, Ohio.

Cleveland Crane Cab

Providing full vision for the operator, comfortable sit-down control, and air conditioning, a cab for overhead traveling cranes has been developed by The Cleveland Crane & Engineering Co., Wickliffe, Ohio. Cylindrical in shape, the cab includes transparent enclosure panels which extend to the floor, thus permitting maximum vision in every direction over the area covered by the crane. The panels are made of a plastic which is claimed to be shatter proof and impervious to certain gases that may be injurious to glass.



Cleveland Crane Cab

The design of the cab also includes conveniently located master switches especially constructed for magnetic con-

Harden Your Cutting Tools in "SENTRY ATMOSPHERE" . . .





All types of high-speed steel cutting tools are hardened quickly and correctly by the *SENTRY DIAMOND BLOCK METHOD OF ATMOSPHERIC CONTROL.* The Diamond Block inside the furnace, combines with air to generate a rich, protective gas. This automatic, accurate atmospheric control assures uniform hardening, even by unskilled hands. *No regulating. No Adjustment.* Model "Y" Furnaces heat to 2350°F in an hour. Ample Tool size capacities.

Clean — Quiet — Reliable — Safe

- **LOW COST**
- **NO DECARBURIZATION**
- **NO SOFT SKIN**
- **SCALE-FREE**
- **MAXIMUM HARDNESS**
- **TRUE TO SIZE**

Send samples for demonstration or write for Bulletin 1024-1E2

Sentry

The Sentry Company

FOXBORO, MASS., U. S. A.

trol. Hoist and trolley switches are attached to the right and left arms of the operator's chair. The bridge switch is located on the floor and is controlled with the right foot.

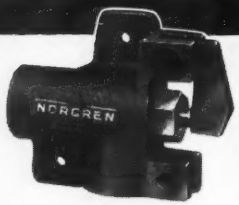
An air conditioning unit provides fresh clean air in the cab at any normal temperature desired and affords protection against objectionable gases, dusts, and fumes.

A unique feature of the Cleveland Crane Cab is a traveling platform which serves both as a vestibule to the cab and as a means for easy access to the entire exterior side of the window for cleaning purposes. Safety locks on both the platform and the cab door prevent operation of either except when the platform is in proper position.

Completely self-contained, the Cleveland Crane Cab may be furnished with any new crane employing magnetic control or may be applied to existing cranes of any make. The cab measures 6 feet 6 inches high x 4 feet 6 inches diameter.

Norgren

BLOW VALVES



Speed operation of punch presses, drilling, tapping, reaming, screw and milling machines. Cast brass body, hardened steel cam, adjustable operating finger. Light puff to full blast, positively controlled. C. A. Norgren Co., 220 Santa Fe Dr., Denver 9, Colo.

Norgren

Oil-Rite Style DA Adjustable Gravity Feed Oiler

Said to be especially suitable for continuous operating machines requiring a slow or medium feed of filtered oil, the Oil-Rite Style DA Adjustable Gravity Feed Oiler illustrated herewith is announced by the Oil-Rite Corp., 3484 S. 13th St., Milwaukee 7, Wis. The unit consists of two principal parts — a base and a reservoir. The base is made of brass and the reservoir of unbreakable plastic. A self-closing hinged lid on top of the reservoir facilitates refilling when necessary. The oiler can be taken apart for cleaning—by simply unscrewing the reservoir from the base.

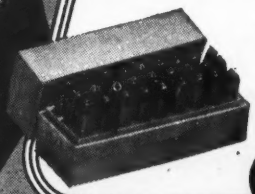
Oil is fed by gravity through a port which can be adjusted to provide a



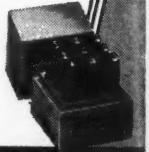
Oil-Rite Style DA Adjustable Gravity Feed Oiler

For all deep, clean, accurate marking on alloy steels, forgings, castings, parts, etc.

ACROMARK HEAVY-DUTY STEEL STAMPS



Made of specially selected alloy tool steel, ACROMARK Steel Stamps are hardened and tempered by modern heat-treating methods. Perfectly balanced and aligned for accurate marking, stamps are tapered to face for easy positioning. Extra heavy bevel for extra biting strength. Write for literature.



THE ACROMARK CO.

9 MORRELL STREET, ELIZABETH 4, NEW JERSEY

. . . if it's easier

to move the saw to the work

get a Portable

WELLS No. 8



SPECIFICATIONS
WELLS No. 8

CAPACITY: Rectangular	8" x 16"
(Special Guides)	5" x 24"
ROUNDS	8" diameter
MOTOR	½ H. P., A. C. or D. C.
SPEEDS	Selective 60, 90, 130 feet per minute.
WEIGHT	Approximately 750 pounds

WHY waste time and manpower moving stock to a fixed saw—it's easier to roll a portable Wells right where you want the cutting done. The Wells cuts quickly, most any shape or size metal you can get into it . . . with a minimum of labor. Easy to use, economical, this handy Wells No. 8 frees larger units for production work, pays for itself in time and labor savings. Write for details.

Wells SAWS

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

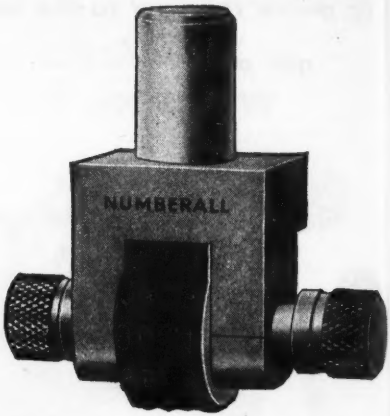
WELLS MANUFACTURING CORPORATION
808 TYLER STREET, THREE RIVERS, MICH.

steady flow of oil or can be closed entirely. The oil port is located slightly above the bottom of the reservoir so that dust and dirt settling at the bottom will not readily enter the port. An oil filter is situated over the oil port, thus preventing any impurities from entering the bearings.

The Oil-Rite Style DA Adjustable Gravity Feed Oiler is available in four body sizes with ⅛ or ¼-inch pipe threads, and in capacities of ⅛, ¼, ½, and 1 ounce.

Numberall Model 85 Numbering Machine

Designed for indenting numbers and letters on metal, plastics, and other materials, a numbering machine designated as the Model 85 is now being manufactured by the Numberall Stamp and Tool Co., Huguenot Park, Staten Island 12, N. Y. The numbering wheels are set to the required characters by turning knobs. By pushing the knobs right or left, the last two wheels may be engaged and turned to the required numbers. In this manner, consecutive numbering can be effected quickly since the last wheel is turned ten times and the second last wheel is turned once.



Numberall Model 85 Numbering Machine

The wheel for the "hundreds" is turned by hand, or with a Numberall spanner wrench, once every hundred markings.

The COLBORNE Speed Lathes

SPEED UP FINAL OPERATIONS ON
DIES • GEARS • SCREWS • LONG RODS



A recent addition to the COLBORNE line of Speed Lathes is the Series 30 machine. This speed lathe is indispensable for economical polishing, grinding, burring and lapping.

Very compactly constructed to do highest quality work with the COLBORNE features of spindle bearings running in oil, instant stopping brake, easy opening collet and standard speeds of 600-920-1720-3280-4800 RPM using ¾ H.P. motor and cone pulleys. Collets and chuck may be used.

For more production per day choose COLBORNE.

PROMPT DELIVERIES

Write for Details Today.



COLBORNE MFG. COMPANY

Builders Since 1879

157 DIVISION ST. CHICAGO, ILL.

BIG IMPROVEMENT



in hand operated straightening presses

The No. 576 General Hand Screw Straightening Press has many advantages. It is powerful, fast, easy to operate, rugged and simple. It is ideal for the heat treating plant or toolroom . . . in fact, wherever straightening is to be done upon a wide variety of parts. It is made by the company that has specialized in the building of power operated straightening presses for the last 21 years.

Write for New Bulletin No. 365

GENERAL MANUFACTURING COMPANY•

6433 Farnsworth • **DETROIT 11, MICHIGAN**

The fourth wheel is turned once every thousand markings.

The Numberall Model 85 Numbering Machine is custom built and may be obtained with $\frac{1}{16}$ to $\frac{1}{4}$-inch size figures. Letter wheels with up to 11 letters and a blank on each wheel can also be supplied. The head of the Model 85 can be furnished in sizes with from 1 to 15 wheels and can be used in Numberall platforms Nos. 45, 46 and 47 or in power and foot presses.

Grobet Twin-Fluted Countersink

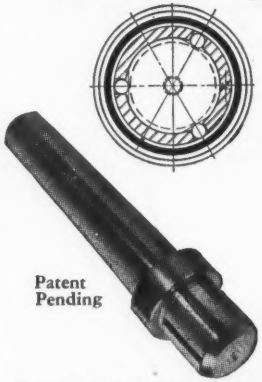
The Grobet File Company of America, 421 Canal St., New York 13, N. Y., announces the addition to its line of chatterless countersinks of a twin-fluted countersink which is recommended for cutting aluminum, magnesium, steel, plastics, and other materials. The tool is made of high speed steel which is ground after hardening to close tolerances.

The Grobet Twin-Fluted Countersink is furnished in sets of eight, providing a full range of six sizes with duplicates in two sizes. According to the manufacturer, the tool produces a chamfer that is free from ridges or chatter marks and is accurately uniform in all cases. The various sizes of countersinks are supplied in a durable hinged box of polished wood with individual pocket for each size tool. The standard set is made with 41-deg. c/1 angles, however, the twin-fluted countersink may also be obtained with 45 and 30-deg. c/1 angles.



Grobet Twin-Fluted Countersink

ENGINEERS AND PRODUCTION MEN *LOOK!*
—Concentricity In Low 10,000ths Is Yours—



Patent Pending

Quotations Definitely Moderate
Good Delivery Schedules

YOUNG ARBOR CO.
3257 Bradford Rd
Cleveland Heights 18, Ohio
Phone YE. 9784

BOOST PRODUCTION and PRODUCT QUALITY

Young Precision Mandrels—
"Roller Clutch Expansion"

Such accuracy is a safety factor that absorbs an operator's margin of error—without additional skill, time or cost.

Reduce scrap, salvage, maintenance costs, tool costs.

NO MORE "C" WASHERS
WRENCHES • DRAWBARS

Uniform full work-length friction locking—complete control and contact of your entire bore surface area. Repeated placement of parts in successively exact position duplication. Self-contained, self-expanding, self-locking — instant unloading — interchangeable sleeves. Built to your bore tolerance limits. For taper, straight shank, face plate or between centers mountings. Any machine operation. For bore diameters .718 to 5.0. Quotations made from your detailed sketches of desired mandrels showing part in position.



New Micrometer Accuracy

WITH SAV-WAY MASTER SETTING AND CHECKING ROLLS



Every Mechanic Needs This Set

Every production man knows that precision tools and inspection devices are only as accurate as the methods and gages by which they are checked and set. When anvils are worn unevenly, flat gage blocks may not be adequate. This Sav-Way set of Master Setting and Checking Rolls provides for the first time a really accurate means of checking micrometers, and other types of gages under all conditions of wear. The set consists of 20 rolls, ranging from .100″ to 2.000″ diameter. Rolls are hardened, ground, and lapped to X gage tolerance. The set is housed in a modern, transparent, plastic case.



A new micrometer instruction book full of valuable technical information will accompany each set.

CLIP THIS COUPON TO YOUR LETTERHEAD

SAV-WAY INDUSTRIES
Box 117, Harper Sta., Detroit 13, Mich.

Please send me illustrated literature on the Master Setting and Checking Rolls.

Name_____

Street and No._____

City_____

State_____

Sav-Way INDUSTRIES
Products Division

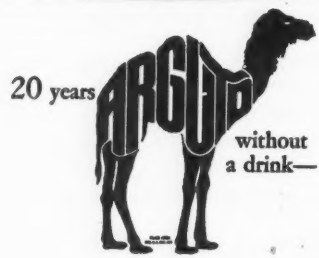
BOX 117, HARPER STATION, DETROIT 13, MICHIGAN

ARGUTO
OILLESS BEARINGS



. . . IN MANY DIFFERENT
APPLICATIONS

"OUTWEARS THE BEST
BRONZE METAL"



ARGUTO OILLESS BEARING CO.
WAYNE JUNCTION PHILADELPHIA

Gray-Mills "Superflo" Centrifugal Pump

Unusually high volume delivery per horsepower and ease of maintenance are outstanding features claimed for a centrifugal coolant pump for coolants, cutting oils, and lubricants which has been brought out by the Gray-Mills Co., 1948 Ridge Ave., Evanston, Ill. Known as the "Superflo," the pump includes an integrally mounted heavy duty motor which is available in 1/25, ⅛, ¼, and ½ h.p. sizes for pumping from 9 to 75 gallons of liquid per hour.

The Gray-Mills Superflo Centrifugal Pump can be obtained in 13 basic models with various voltage characteristics. Included are types for horizontal-external mounting, vertical-external mounting, and with floating impellers for submerging in the coolant system reservoir. The latter may be used for fluids having abrasive content. To eliminate the need for lubrication, the Superflo Pump is provided with grease-sealed motor bearings and mechanical seals.



Gray-Mills "Superflo" Centrifugal Pumps

Gairing Block-Type Boring Tool

The Gairing Tool Co., Detroit 32, Mich., has developed a boring tool which features a readily detachable cutter block that allows for the quick in-

SCULLY-JONES

Style A'

TAP CHUCKS



Universally used for individual or modern mass production, the Scully-Jones Style "A" tap chuck is a one-piece tool designed for driving taps in any type of machine having a spindle holder or attachment with a Morse taper hole.

True-running, definite stop, positive drive, smaller in diameter than spindle, quick insertion and easy ejection, are advantages that reduce tap breakage and speed up production.

Write for our complete listing of sizes.

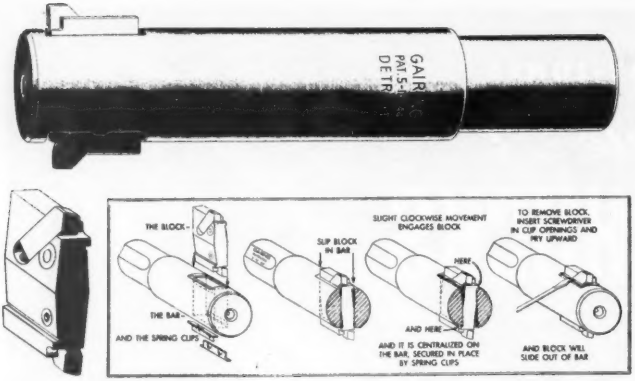
5 Big FEATURES

STYLE "A" TAP CHUCKS

1. Driver: By Square — a positive drive
2. Centers By Shank — for correct alignment
3. Collet Action — locks tap in chuck
4. Taper Shank — fits any M.T. hole
5. Four Point Bearing — gives collet action

Scully-Jones AND COMPANY

1901 SOUTH ROCKWELL STREET • CHICAGO 8, U. S. A.



Gairing Block-Type Boring Tool

serting and positive locking of the block in the bar without the aid of locating holes or screws, keys, wedges, or taper pins.

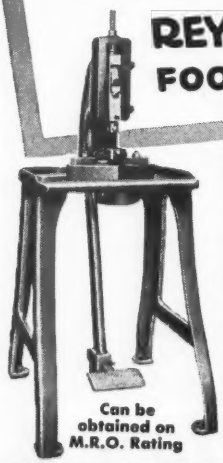
The block, which also allows for full adjustment of blades, is provided with projecting lugs which, when the block is inserted in the bar, engage the precision ground flats on the bar, thus accurately centering the blocks. Spring clips are then snapped into the block to hold it in place and effectively seal the unit from dirt, chips, and so on. With the block thus located, the cutting thrust pressure is said to be evenly distributed against the back and bottom of the slot.

The Gairing Block-Type Boring Tool can be obtained with blocks having high speed steel, cast alloy, or tungsten carbide tipped blades.

Gray-Mills Model P-72 Small Parts Cleaner

The Gray-Mills Co., 1948 Ridge Ave., Evanston, Ill., announces a small parts

REYNOLDS FOOT PRESS



$65 Complete as shown
F. O. B. Providence
(Crating $5.00 Extra)

SPECIFICATIONS
Full Length stroke 2 3/8"
Greatest distance from bottom of plunger to platen ..... 5 3/4"
Length of Collet ..... 1 1/2"
Distance between center of plunger and back of press ..... 3 3/8"
Distance between centers of stud bolts 7 1/8"
Floor space ..... 22"x22"
Weight about ..... 300 lbs.

Can be obtained on M.R.O. Rating

REYNOLDS MACHINERY COMPANY
211 EDDY STREET, PROVIDENCE 3, RHODE ISLAND

LEACH External Grinder

PRICE
$875.00
Fully Equipped

Grinds Work from 3/4" to 11" in length and from 1/8" to 7" in diameter.

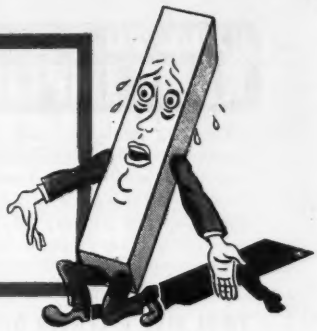
Write us today for your nearest dealer's name and address.



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EXCELLENT DELIVERIES

Exclusive Selling Agents
H. LEACH MACHINERY CO.
387 CHARLES ST. PROVIDENCE, R. I.
Agents in all Principal Cities Throughout the World

Stop Abusing Your Tool Bits



Users say:
The first real tool holder improvement in 25 years!

Exclusive vise-grip jaw eliminates rocking, because it exerts equalized pressure over *full* length of cutter channel, and not just at one point. Screw-operated jaw runs right to cutting edge and hugs bit so it can't slip, can't sag, can't break!

Holds All Sizes and Shapes

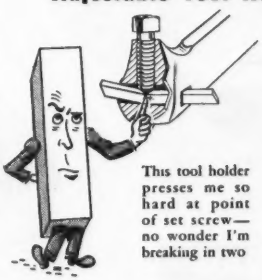
One Clark Adjustable Tool Holder takes 4 or more sizes of square, undersize, round or out-of-round, or narrow tool bits for cutting-off or special forming operations. Short bits and stub ends may now be used up.

For Carbide Tools and Boring Bars

In addition to standard Clark Adjustable Tool Holder with 15° cutter channel, there's the Clark Parallel Tool Holder for better seating and better clamping action on carbide bits, threading tools, and boring bars.

For complete information about Clark Adjustable Tool Holder, call your Clark Cutter Jobber today, or write for catalog MMS-7-TH

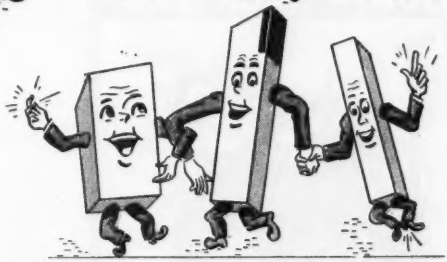
Change Now to Clark
Adjustable Tool Holder with Vise-Grip Jaw



This tool holder presses me so hard at point of set screw—no wonder I'm breaking in two



Fine, smooth, full-length grip of Clark Adjustable Tool Holder really holds without breaking my back.



SHORT STUBBY

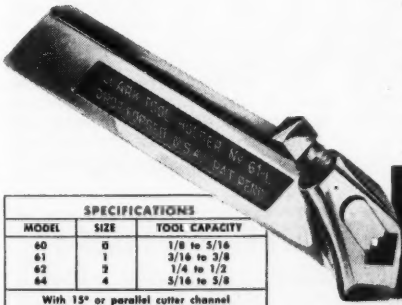
Clark Tool Holder is best for me—adds years to my life!

CARBIE CARBIDE

Boy! I like that extra support right to my cutting edge

UNDER SIZE

Whee! Now I'm good for cutting-off or other operations.



SPECIFICATIONS		
MODEL	SIZE	TOOL CAPACITY
60	0	1/8 to 5/16
61	1	3/16 to 3/8
62	2	1/4 to 1/2
64	4	5/16 to 5/8
With 15° or parallel cutter channel either left or right hand.		

CLARK CUTTERS

Robert H. Clark Company

9330 SANTA MONICA BOULEVARD • BEVERLY HILLS, CALIFORNIA

ALL THAT THE
NAME IMPLIES

TRU-CUT engineers have combined the sound fundamental of metallurgy with an advanced degree of skill in developing a new heat treating process of high speed steels, resulting in one of the greatest machine tool efficiency changes in tool history

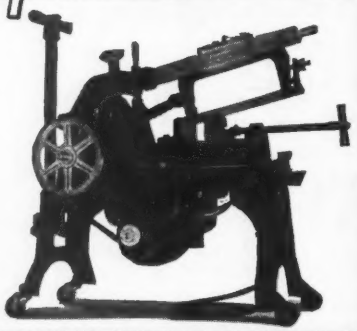
TOOL BITS • CENTER DRILLS
KEY SEAT CUTTERS • END MILLS
MILLING CUTTERS • FORM TOOLS

Write for Illustrated Catalog

Tru-Cut
TOOL COMPANY

14236 BIRWOOD AVE.
Detroit 4, Michigan

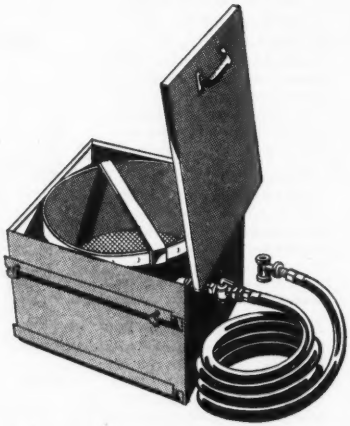
POWER HACK SAW ★



Low Priced Self-Contained
Portable
Ready to Work—Economical
Sturdy
Write for Bulletin No. 100
MILLER-KNUTH MFG. CO. OMAHA NEB.

cleaning system designated as the Model P-72, as well as a line of cold cleaning solvents to be known as "Agitene." The Model P-72 is intended for removing cutting oils and lubricants used in metal-working operations and is said to be ideal for many simple cleaning operations where small parts are to be cleaned in limited quantities.

Outstanding features of the Gray-Mills P-72 Small Parts Cleaner include an Air-gitator which provides air agitation of the (cold) solvent; swisher basket and platform; hinged cover; air hose and T-connection. The unit measures 15½x15½x11½ inches overall and is provided with mounting brackets so that it



Gray-Mills Model P-72 Small Parts Cleaner

can be attached to the side of the Gray-Mills larger Model P-72 parts cleaning system or to a wall or workbench.

Agitene (cold) cleaning solvents are available in three types—Regular Agitene for general purpose cleaning in removing cutting oils and other lubricants; Super-Agitene, a fast-acting solvent with a powerful penetrating action that is said to quickly remove grease, tar and sludge; and Speed-Agitene for removal of hard accumulations, residual gums, and grease deposits.

Micro-King Mill-Drill

Said to mill or drill sheet metals on any form of plastic material without twisting out of shape or shattering, the

HEAR SEE FEEL

Sensory TORQUE WRENCH



Reflex Torque Control by sight, sound and feel—automatically fast, involuntarily accurate.

Set to desired torque in a few seconds—no further adjustments.

No wearing or moving parts in measuring element—no gears, levers, glass dials or fragile mechanisms.

***Permanently Accurate* Torque Wrenches—with automatically accurate operation.**

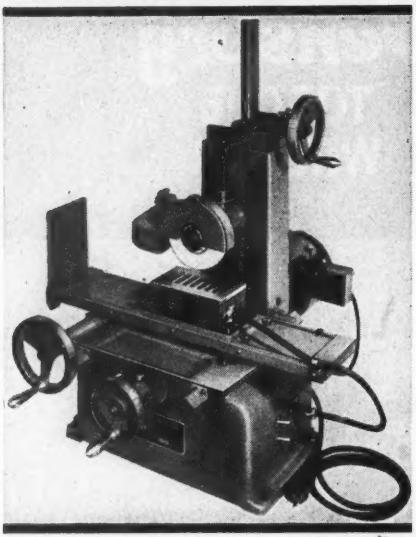
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STURTEVANT

31 Capacities—ranges from 0-8 inch ounces to 0-7200 inch pounds.

P A STURTEVANT CO.
ADDISON QUALITY ILLINOIS

SANFORD



HIGH SPEED
BENCH
SURFACE GRINDER

ACCURACY WITHIN .0001

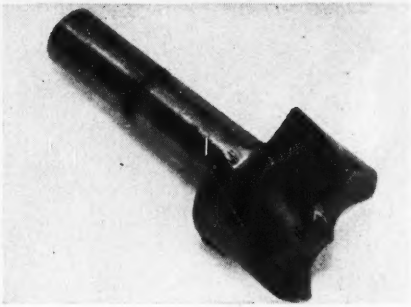
A sensitive, highly accurate, machine specially designed

"For The Job That Fits in Your Palm"

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Available on M.R.O. Certifications

SANFORD MFG. CO.
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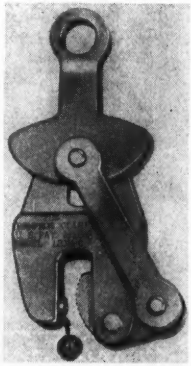
Micro-King Mill-Drill

Micro-King Mill-Drill illustrated herewith has been placed on the market by Steel Tools, Inc., 2307 Prospect Ave., Cleveland 15, Ohio. Chrome plated, the tool is constructed to drill smooth, accurate holes in one operation and may be used on Lucite, Plexiglas, Bakelite, Lignolite, and many other plastics, as well as brass, copper, aluminum, and tin sheets, magnesium bars, hard rubber, and so on.

The Micro-King Mill-Drill is available in sets comprising one drill box, 16 drills, and 16 templates. Set No. 1 includes drills from $\frac{1}{8}$ to 2 inches in $\frac{1}{8}$-inch sizes, and Set No. 2 includes drills from $\frac{1}{16}$ to $1\frac{15}{16}$ inches in $\frac{1}{16}$-inch sizes.

Renfroe Clamp

A unique type of clamp for lifting steel plate is now being marketed under the trade name of Renfroe by the Paul Henry Co., 2037 S. La Cienega Blvd., Los Angeles, Calif. Through the action of a cam shackle, work is said to be gripped instantly and firmly the moment tension is applied to the lift by a crane, even though the body of the clamp is in a horizontal position.



Renfroe Clamp for Lifting Steel Plate

G I L M O R E

Needle Point Diamonds

For truing fine grained or sharp edge grinding wheels

Four different angles of conical point. 60° and 75° points for every delicate use. 90° and 120° points for general use. The narrow diamonds set in these stools stay reasonably sharp until completely used.



Magnified view of GILMORE NEEDLE POINT DIAMOND. Notice how deep the diamond is set into shank. This feature assures long wear and rugged use. Furnished in three sizes of holders. Discounts in quantities.



N-1: "Phonepoint." Most popular size.



N-2: Dimensions, 1/8" x 3/4".



N-3: Dimensions, 3/16" x 1".

Write for NEW complete catalog on Diamond Tools for Precision Grinding.

F. F. GILMORE & CO.

285 COLUMBUS AVE. BOSTON, MASS.

D I A M O N D S



The JA Featherweight is a distinct improvement over all models previously produced by Madison-Kipp — the originators of really high speed grinders

Inside and outside the design is new. In it are utilized fewer parts, and they are made of magnesium and aluminum for extreme featherweight lightness. The alloy steel shaft diameter is unusually large for sustained smooth and true operation. The speed, as before, is governed at 50,000 R.P.M. and there are selected ball bearings, front and rear. The same low price, $29.75 in U.S.A. remains.

$29.75 IN U.S.A.

Weight 12 ounces; length 6¾ inches; chuck size ⅛ inch. Wheel guard removed for better illustration.

MADISON-KIPP CORPORATION
208 WAUBESA ST., MADISON 4, WIS., U. S. A.

The inserted swivel jaw opposite the gripping cam and operating in conjunction with the cam provides an unusually deep and firm bite on the plate.

The swivel jaw and gripping cam and all other working or stationary parts of the Renfroe Clamp are readily replaceable. All parts are made of steel specially selected according to the particular function of each part.

The Renfroe Clamp is available in 1, 1½, 3, 5, 10, and 20-ton capacities.

Watchemoket "Eye Savers" Goggle

An all-plastic goggle which is designed to fit directly over prescription glasses and includes a full frame which provides added protection against injury from sides, top, and bottom, to be known as the "Eye Savers," is now being marketed by the Watchemoket Optical Co., Providence, R. I. According to the manufacturer, the lens material is crystal clear, non-distorting, and will not shatter or splinter under impact. Lenses are easily removed for cleaning.



Watchemoket "Eye Savers" Goggle

The frame of the goggle is strongly reinforced with a metal clip at the bridge and is amply ventilated to prevent fogging of the lenses. Unusually light in weight (1¾ oz.), the goggle can be equipped with snap-in filters for torch welding or cutting, as well as for protection against other glares.

It's so SIMPLE

to cut ACCURATE threads from 1/16" to 3 1/4" diameter with GEOMETRIC Rotary DIE HEADS

Simple and "fool-proof" in construction — easy to use, easy to re-sharpen — yet a light, compact, sensitive precise tool that will cut from 1/16" to 3 1/4" diameter —

That's the essence of the reasons why GEOMETRIC Rotary DIE HEADS have proved so popular for use on live spindle machines, especially automatic screw machines.

Note the simple, compact design of the head — no awkward adjusting screws — no stop levers — perfectly balanced.

Another important feature — note how the chasers protrude through the front of the head so they can cut close to a shoulder without having to remove the face plates.

Simplicity is the key to the increasing trend toward the use of GEOMETRIC Die Heads — saving time and expense in operation, re-sharpening and replacements.

GEO MET RIC

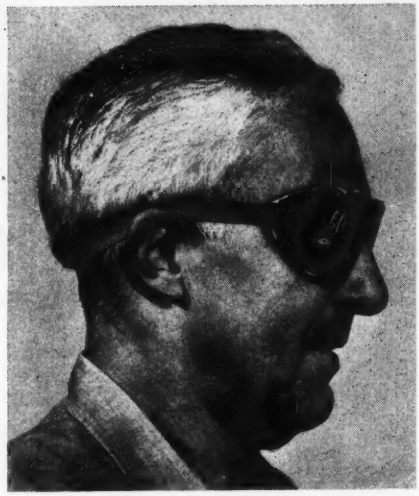
Built in two types—Style KD for the coarser pitches—Style CK for the finer pitches. Write for a FREE Booklet on this tool.



The GEOMETRIC TOOL COMPANY

AO 301A Duralite Safety Goggle

An improved Duralite Safety Goggle designed for workers facing the hazards of flying objects is announced by the American Optical Co., Southbridge, Mass. A major improvement in the goggle, which is designated as the 301A, is a newly designed eyecup which is considerably larger in area and more face conforming than the previous cup, thus providing maximum eye protection, increased ventilation, and greater comfort. Shaped separately to fit the contour of the right and left eye, the cups



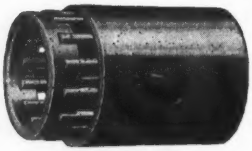
AO 301A Duralite Safety Goggle

fit snugly against the face and protect the eyes from objects striking from the sides, top, or bottom. Non-conductors of heat and electricity, the new cups also provide wider angle of vision.

The new nasal section and enlarged facial contact roll of the AO 301A Duralite Safety Goggle conform to the shape of the face. The smooth round edges of the eyecups are said to fit snugly and stay in place comfortably. In addition, air channels in the edges of the eyecups, together with extra side perforations, provide for greatly increased ventilation. A natural draft is accordingly produced behind the lenses, thereby reducing the possibility of fogging.

The AO 301A Duralite Goggle is sup-

GWILLIAM
JOURNAL ROLLER BEARINGS



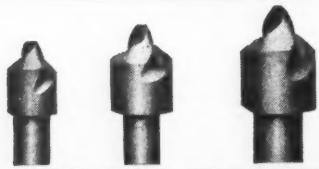
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THE GWILLIAM CO.
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BROOKLYN 2, N. Y.

write for Discounts and Bulletin No. 451



Grobet
TWIN FLUTED COUNTERSINKS
GROBET FILE CO. of AMERICA • 421 CANAL ST. NEW YORK CITY

THROUGH LEADING JOBBERS IN PRINCIPAL CITIES

...AS SIDE-TRACKED CIVILIAN PRODUCTION IS SWITCHED BACK TO THE MAIN LINE



● Here at Electric Sprayit Company we've already received the "high sign" from the yardmaster in Washington that it's OK to start switching civilian production back to the main line. We'll be set up on a double track schedule too, with merchandise that is streamlined to meet every marketing demand...superior quality...competitive prices... fair profits...good service...and every other facility to make Sprayit and Elsco two of your favorite products. These new and better lines will be available "Through Leading Jobbers In Principal Cities Throughout the United States." Keep in touch with your jobber, or write Electric Sprayit Company, Sheboygan, Wisconsin, for further particulars.



plied with either 50 mm. Super Armorplate lenses in white glass or 50 mm. Super Armorplate lenses in Calobar medium, dark, or extra dark shades. If desired, 6-curved Super Amorplate lenses can also be furnished.

B & C "Hundred" Series Face Shield

Designed to provide maximum comfort to the wearer, a face shield featuring complete interchangeability of parts, to be known as the "Hundred" Series, is announced by the Boyer-Campbell Co., 6540 St. Antoine St., Detroit 2, Mich. The face shield is available in four models designated as the 100, 200, 300, and 400, each model being identified by a variance in the design of the head gear. For each model of face shield a choice is also offered of three different thicknesses and three different sizes of cellulose acetate general purpose windows, three different sizes of 24-mesh screen windows for heat protection, and a fiber front for scarfing and welding.

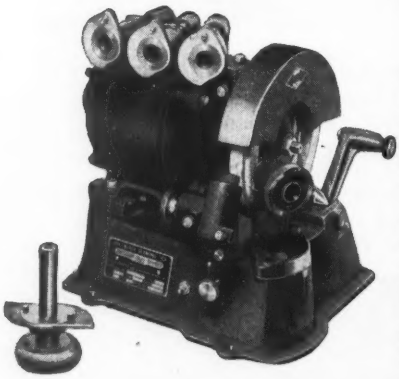
The back head band of the B & C Hundred Series Face Shield is designed for low wearing on the head and is completely adjustable for snug fitting to any size of head in either the elastic head band (Models 30 and 400) types. In this manner, the weight of the shield is evenly distributed over the entire head gear with the result that there is no sense of burden or unbalance no matter



B & C "Hundred" Series Face Shield

RECONVERSION TO CIVILIAN PRODUCTS WILL ALSO REQUIRE MANY SMALL SHARP DRILLS. KEEP SMALL DRILLS SHARP WITH

BLACK DIAMOND
DRILL GRINDERS



FOR SMALL GAUGE AND FRACTIONAL DRILLS

You can save valuable time and skilled labor by using a Black Diamond Grinder for sharpening of all small gauge and fractional drills. Simple instruction *makes the most unskilled operator an expert* on producing quantities of perfectly sharpened drills with lips of uniform length, correct angle and clearance.

To speed production and save expensive drill stock — to reduce drill breakage and release skilled labor for more important work, install a Black Diamond Drill Grinder at once.

The Diamond Dresser keeps the grinding wheel sharp cutting and the Web Thinning Attachment efficiently cares for the grinding of Notched, Colton or Crank shaft points. You can't equal a Black Diamond.

Write at once for complete details.

BLACK DIAMOND SAW & MACHINE WORKS, INC.

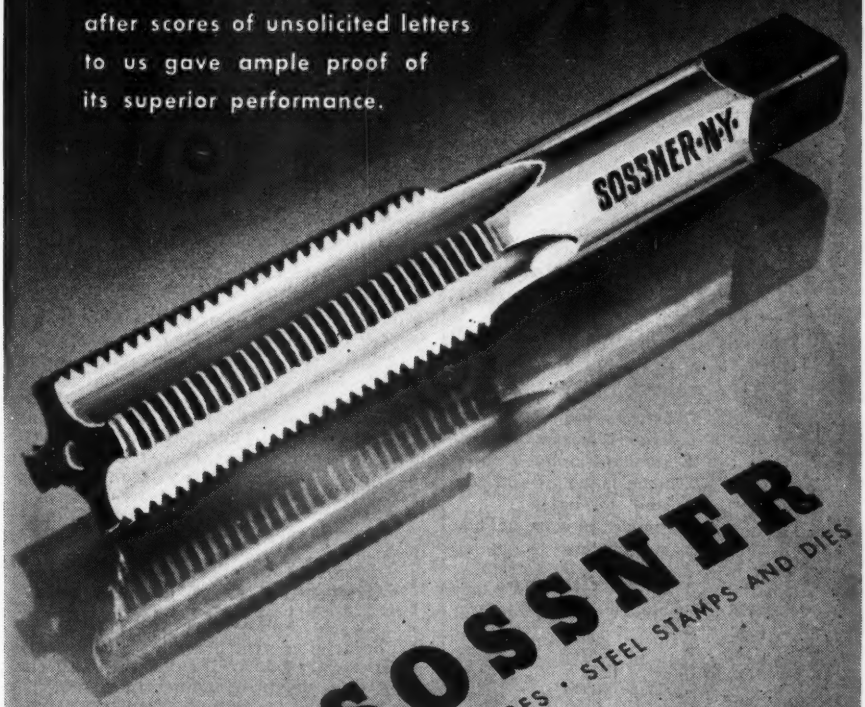
45 NORTH AVENUE **NATICK, MASSACHUSETTS**

sossner's

mirror finish

less friction • greater wear-resistance • finer part finish

This Sossner developed finish is now included on ALL of our taps . . . after scores of unsolicited letters to us gave ample proof of its superior performance.



SOSSNER

TAPS • GAGES • STEEL STAMPS AND DIES

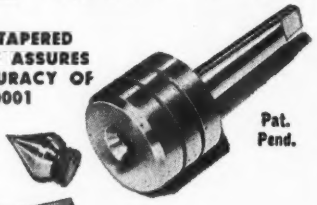
161 GRAND STREET, NEW YORK 13 or 27 BROADWAY, LYNBROOK, N. Y.

Empire LIVE CENTER

With Interchangeable Points

ACCURATE • VERSATILE • HEAVY DUTY

THE TAPERED SEAT ASSURES ACCURACY OF ± .0001

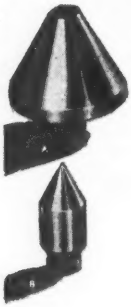


Pat. Pend.



Empire Toolmaker's Set available in wooden case—each tool in its own recess.

Points for Various Operations



A. Very large, for pipe or tubing work
B. Extra long point used in facing operations
C. Extra wide point for large diameter work
D. Standard point
E. Blank made of soft tool steel for nests
F. Female for work not having centers

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Mfd. in all tapers, straight shanks, and specials

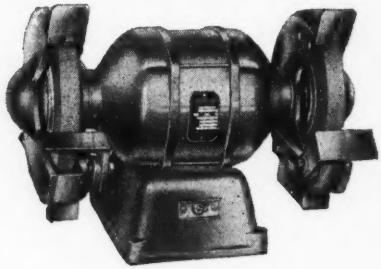
ROYAL PRODUCTS

69 SPRING STREET • NEW YORK 12, N. Y

how long the shield may be worn, the manufacturer states.

Baldor Series 8100 Grinder

Designated as the Series 8100, a ruggedly constructed grinder for heavy duty tool grinding or production work is announced by the Baldor Electric Co., 4351 Duncan Ave., St. Louis 10, Mo. Designed for continuous duty, the machine is arranged to accommodate 8x1-inch Aloxite wheels which are mounted on two heavy ¾-inch diameter arbors. The motor end bells are tapered to provide



Baldor Series 8100 Grinder

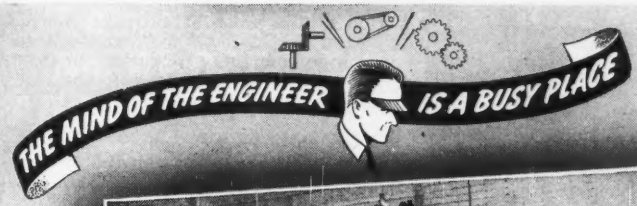
for wide clearance between wheels and motor frames.

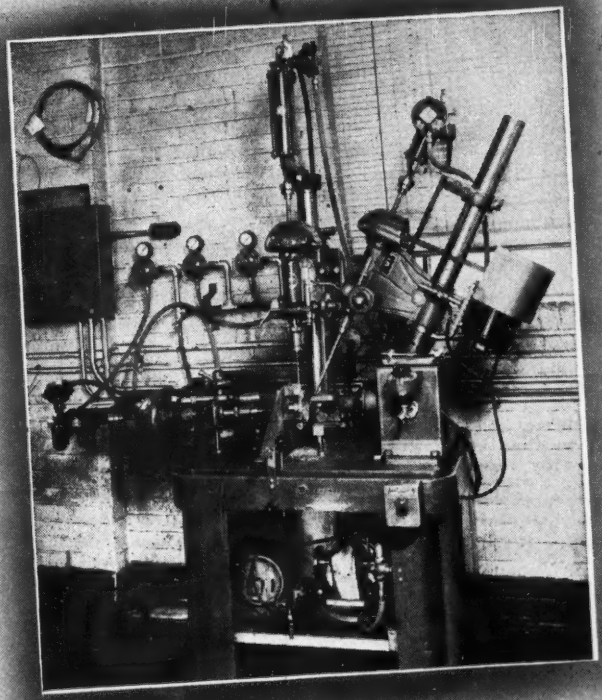
Additional features of the Baldor Series 8100 Grinder include large tool rests and exhaust type guards. When the unit is not connected to an exhaust system, the circulatory action of the wheels tends to carry dust through the exhaust openings away from the operator.

Chrysler Airtem "Packaged" Liquid Cooler

Constructed to provide for uniform temperature control of coolants and cutting oils used in connection with the performance of machine tool operations, the Chrysler Airtemp "Packaged" Liquid Cooler illustrated herewith has been brought out by the Airtemp Division of Chrysler Corp., Dayton, Ohio. Compact and self-contained, the unit is automatic and simple to operate.

The Chrysler Airtemp Packaged Liquid Cooler is so arranged as to remove





TALENT for technical progress brings victory ever closer — lights the way to new peacetime production records.

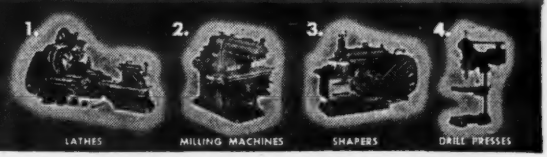
Typical of the ingenious adaptations of Atlas tools is this drilling machine made with Atlas heads and three Bellows Air Motors (Bellows Co., Akron, O.) to feed spindles by direct thrust, through ball thrust bearings.

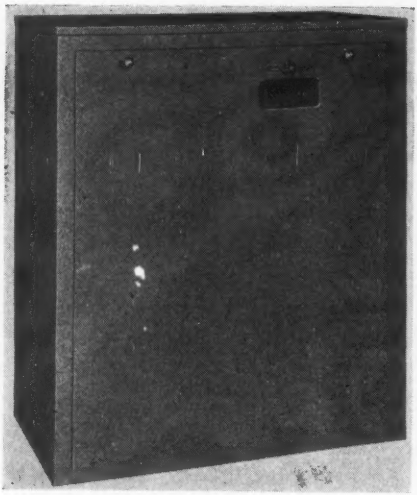
As operator pushes control lever the work piece is automatically clamped in position and the drills feed in proper sequence — drilling three intersecting holes. As last drill retracts, work piece automatically unclamps and machine stops.

Suggest an adaptation in your plant? Send for latest Atlas specification catalogs.

ATLAS PRESS COMPANY, 746 N. Pitcher St., Kalamazoo 13D, Mich.

4 Atlas TOOL TEAM FOR SMALL-PARTS MACHINING





Chrysler Airtemp "Packaged" Liquid Cooler

a constant volume of heat from the coolant equal to that being generated, thus providing for rapid heat dissipation at the point of cutting. The design of the unit is said to lend itself to rearrangement of production lines, with the unit adjustable to suit the individual machine.

Besco Spot Welding Tweezers

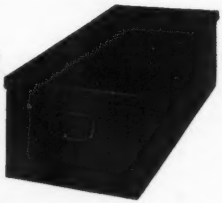
A unique tweezers which allows for the spot welding of practically inaccessible elements of a product is now being manufactured by New Jersey Jewelers' Supply, 280 Plane St., Newark 2, N. J. Designated as the Besco, the vise consists of a pair of insulated forged copper tweezers with plastic covered flexible copper leads terminating in a pair of lugs which are connected in place of regular welding electrodes. Developed originally for use in welding radio tube wires 0.003 inch O. D., the tweezers is applicable in the manufacture of small precise units, instruments, and so on.

The Besco Spot Welding Tweezers is designed for operation on from ½ to 1 kva on 10 ampere current and is used in connection with a timer which cuts the current and times the length of the weld. The copper jaws are held like any ordinary pair of tweezers and are

We can ship immediately

STEEL STACKING BOXES

Top Rim Type 18" x 12" x 6".
16 Ga. with Drop Handles
at $1.27 each



STANDARD SIZES

18 x 12 x 6.....16 Ga.	16 x 10 x 6.....18 Ga.
18 x 12 x 8.....16 Ga.	16 x 10 x 6.....16 Ga.

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BENCH LEGS
Four sizes. All Welded.
Olive Green enamel.

BENCH TOPS
Steel and wood with or without drawers.

Literature on request.

STERLING
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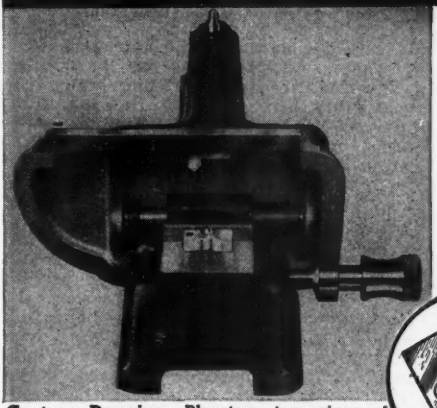
183 CHARLES ST.
PROVIDENCE, R. I.

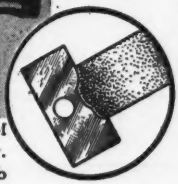
Grinding Odd-Shaped Forms Made Easier!

No. 41 DRESSES AND RE-DRESSES ABRASIVE WHEELS TO ANY CONTOUR

Plus Regular Angle & Radius Dressing

Accuracy and Speed Even for Operators of Limited Experience!





Contour Dressing. Phantom top view of No. 41-B shows template and tracer finger. As the operator turns the knurled knob the tracer finger follows the template and the chisel pointed diamond duplicates the contour on the abrasive wheel. Wheel may be readily re-dressed to same profile even by operator of limited experience. Profile duplication up to 1½ in.

A tool of finest quality for clean accurate dressing at an almost unbelievably low price.

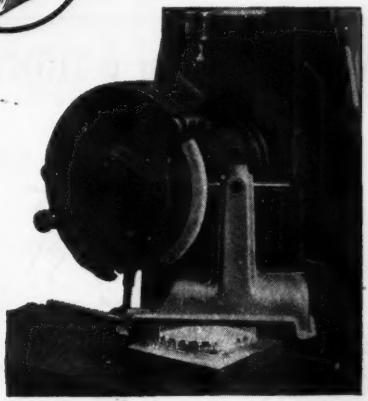
Radius angle and contour dresser complete

185.00

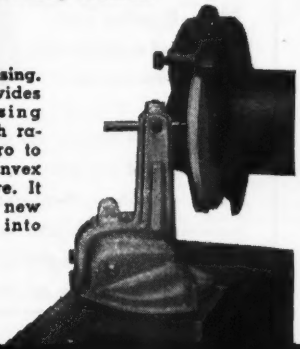
Natural Diamond tool extra **7.50**

Lapped Diamond tool extra **10.00**

Write for Booklet V



Angle Dressing up to 2 in. is possible with No. 41-A. Modern design, lightweight, ease of disassembly are features of the accurate shop-essential tool.



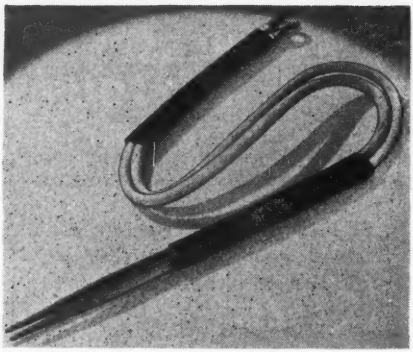
Radius Dressing. No. 41-A provides for dressing wheels with radii from zero to one inch, convex and concave. It introduces new efficiency into the shop.

BEST TOOLS CORPORATION

ROCKVILLE CENTRE, LONG ISLAND, N. Y.

Makers of No. 41 Radius Angle and Contour Dresser and No. 51 Lathe Angle Plate.

BTC



Besco Spot Welding Tweezers

brought in contact with the parts to be welded and lightly, but firmly, pressed together. Current is then applied through a foot switch and the weld produced.

According to the manufacturer, the flexibility of the Besco Spot Welding Tweezers permits its use in pactically any position for uniting copper parts, nickel, steel, tin, tin alloys, brass, Monel, zinc, bronze, nickel to tungsten and copper to nickel.

Cadet "Sealskin"

To protect machinists and those in allied industries from skin infection, eruption, and irritation as a result of contact with solvents and oils, Cadet Laboratories, Dept. MS5, Worcester 5, Mass., has placed on the market a skin-protector compound to be known as "Sealskin." Applied but once daily, the compound, according to the manufacturer, forms a durable, invisible waterproof coating over the skin that acts as a preventive against infection and from which most dyes, stains, and grime may be washed with soap and water without removing the protective coating.

Made to conform to a type recommended by the U. S. Public Health Service as being best suited to protect the skin against solvents and oils, Sealskin may, it is claimed, be safely applied to the most tender skin, even broken skin, since it is both non-irritating and non-sensitizing. Placed in the nostrils, it is said to protect the membranes against fumes, sprays, dusts, pow-

When you're in a TIGHT spot . . . specify Mac-its

PRONOUNCED "MACK-IT"

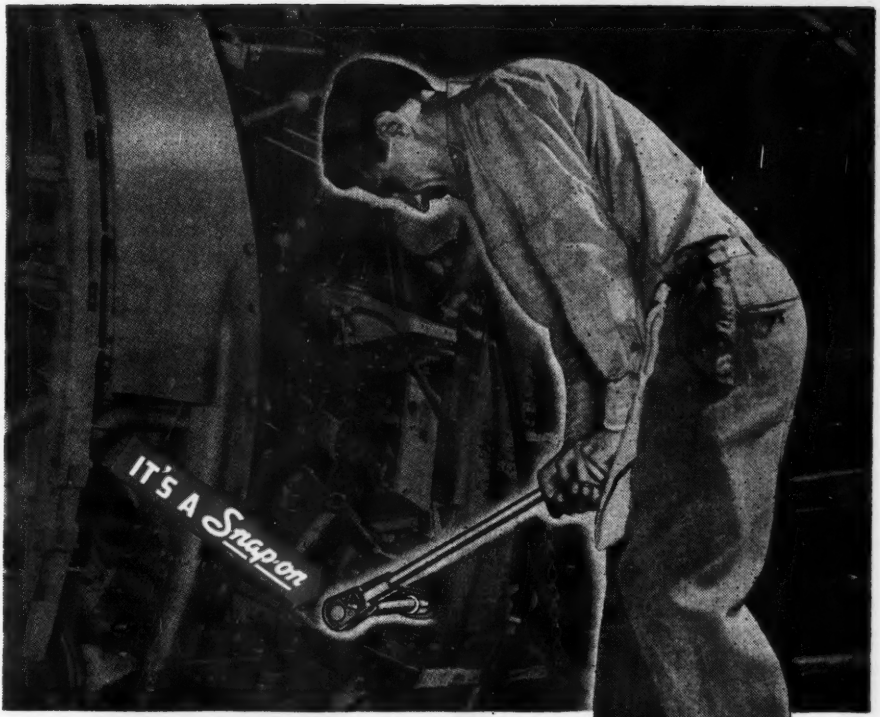




Mac-it alloy steel hollow set screws are milled from the solid bar, with die-cut threads. Hex sockets are generated by a special process insuring full-depth accuracy. Heat-treated for maximum strength and to prevent rounding out or splitting of the socket or upsetting of the point.

Mac-it products include Socket Head Cap Screws, Hollow Set Screws, Hexagon Head Cap Screws, Square Head Set Screws, Stripper Bolts, Hexagon Socket Pipe Plugs.

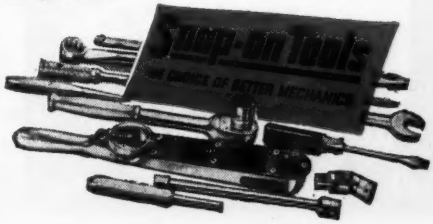
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For the Critical Jobs Snap-on Tools

Sweeping the stratosphere at better than 400 mile speed — screaming earthward in bomb dives — blasting tanks, locomotives, fuel dumps in low level strafing . . . Republic's deadly Thunderbolt handles diverse tactical assignments superbly well. The Thunderbolt is super-powered, heavily armed and armored . . . and its mighty engine is anchored with just four one-inch bolts. In this photograph a Republic worker tightens to solid security one of the four vital nuts . . . and does it easily, safely, swiftly . . . with the *right tool* for the job . . . a Snap-on heavy duty ratchet wrench.

Everywhere in industry Snap-on tools play an important part . . . dependable aids to fast, accurate workmanship in every phase of production, assembly, maintenance. Snap-on direct-to user tool service is available through 38 branch warehouses located in key production centers.



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WELCH Bushings have longer life which reduces your tooling cost.

PRECISION MADE FROM HIGHEST QUALITY TOOL STEEL

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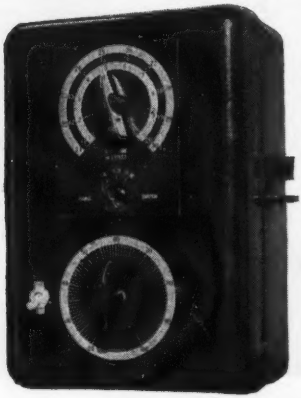
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3011 VERDUGO ROAD
CApital 19101 • LOS ANGELES 41, CALIF.

ders, and other irritants and, since it contains no water, the compound may be used by outdoor workers with no danger of chapping.

Auxiliary Tempering Attachment for G-E Synchronous Spot-Welding Controls

A tempering attachement for use with G-E synchronous spot-welding controls which incorporate the phase-shift method of heat control has been announced by the Industrial Control Division of the General Electric Co., Schenectady, N. Y. The new auxiliary control is said to be particularly suitable for use in the spot welding of air-hardenable steels, since it permits tempering the weld while the work is still in the machine, thus reducing hardness and increasing ductility.



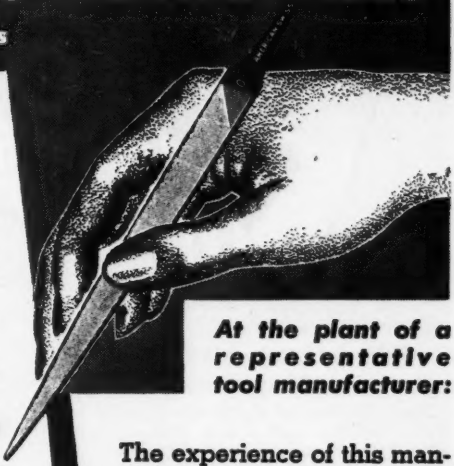
Auxiliary Tempering Attachment for G-E Synchronous Spot-Welding Controls

The attachment consists of a heat-control and a time-control adjuster for tempering, and relays which automatically transfer the additional heat-and-time adjustment from the spot-welding control with which the attachment is being used. The attachment is enclosed in a metal case designed for wall mounting. The calibrated adjustment dials are mounted on the hinged door of this case together with an "on-off" switch for preventing the relays from being energized when ordinary spot or pulsation welding is being done.

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The experience of this manufacturer has been duplicated in plants all over the country, as proven by reports which we have continuously received throughout the 40 years during which we have specialized in the manufacture of Swiss-Pattern files.

"American Swiss" files save filing costs because these precision-made tools have longer filing surface than others, their clean, sharp teeth cut better and faster, and their uniform hardness withstands hard wear and long usage.

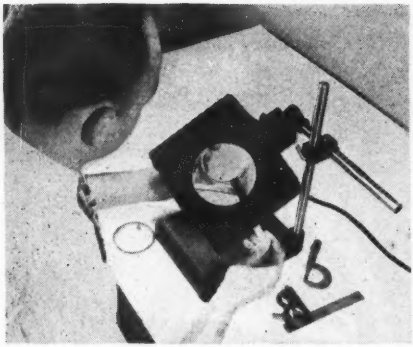
For lowest costs and best results in your accurate and intricate filing work, be sure to insist on "American Swiss" Swiss-Pattern files . . . obtainable from our Distributor in your territory.

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SWISS PATTERN FILES



Ullman All-Angle C-Master Magnifier

Ullman All-Angle C-Master Magnifiers

The addition of three all-angle illuminated models to its line of C-Master magnifiers is announced by the Ullman Products Co., 857 Fourth Ave., Brooklyn 32, N. Y. Two of the units are stand models and the third is a portable hand type.

The lighting equipment of the Stand Model 410 and Portable Model 610 consists of four incandescent tubes which can be lighted two at a time or all four at once. Two fluorescent tubes are used in the Stand Model 210. Shadow-free, compact, and easy to handle, all three models are said to be ideal for continuous inspection where magnification plus light is required. Each model is equipped with a large, clear 4½-inch double convex lens which is ground and polished and provides an undistorted view of the work being inspected. All models are sturdily constructed of cast aluminum and steel with bronze bearings.

Gerotor Air Cylinder

Featuring the complete absence of tie rods, an air cylinder of the double-acting non-rotating type is announced by the Gerotor May Corp., 444 Tacoma Ave., Logansport, Ind. A keeper ring design is said to assure leakproof construction and to permit covers to be rotated to any position for the convenient location of pipe connections. The keeper ring design also provides for compact construction of the cylinder

SEND FOR NEW CATALOG KR



Just off the press—the most complete of its kind, illustrating the full line of GROBET ROTARY FILES, CUTTERS, DIESINKER'S BURS, etc., in size, shape and coarseness of cut for every industrial purpose.

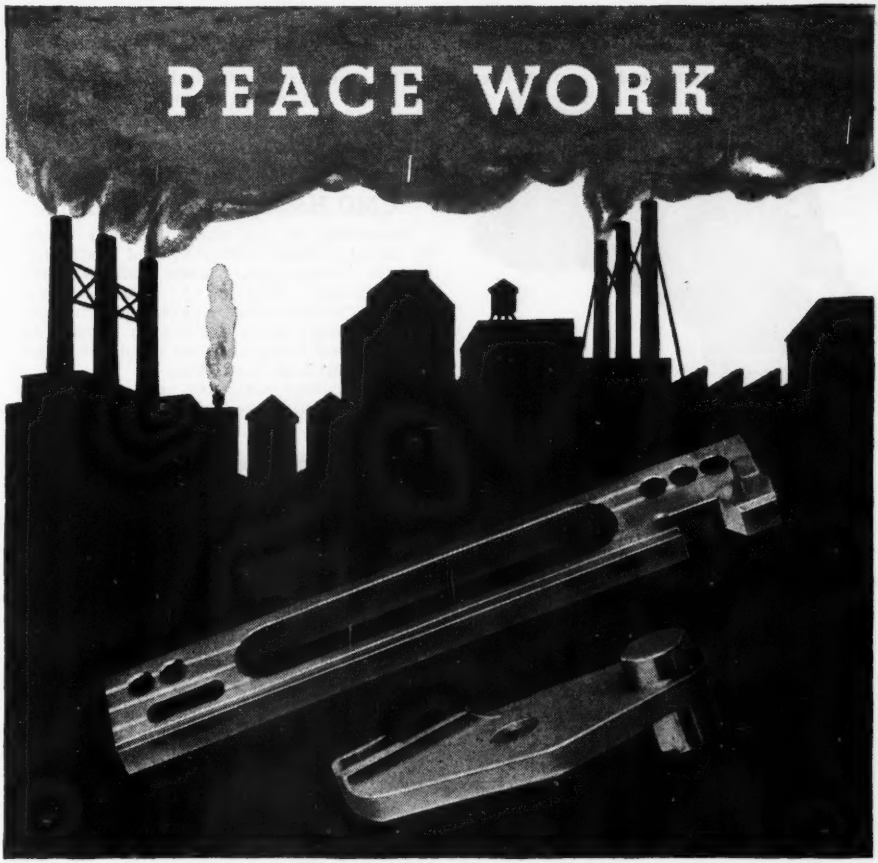
(Please make requests for Catalog KR on your firm letterhead.)

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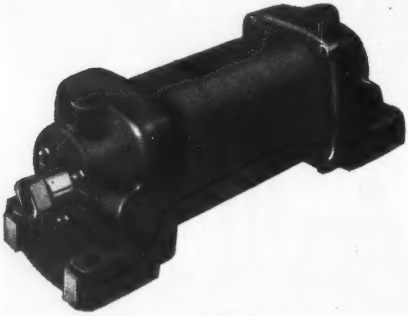
★ ★ ★ These two articles are known to the Army and Navy as parts vitally essential to the breech mechanisms of guns. But manufacturers of peacetime products will do well to note them as excellent examples of the fine precision workmanship that goes into all tools, dies, jigs, fixtures, plastic molds, hardened and precision ground parts, cold forgings, cap screws, bolts, etc., and special equipment that Allied makes *in great quantity*. Uniquely comprehensive experience and superlative equipment and facilities make Allied a dependable source of supply for the automotive, radio, home appliance, plastic, aviation, furniture, electrical, farm implement and many other mass production industries. Allied products may solve some of your "peace work" problems. Send in your blueprints or write—today.

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and permits it to be installed in a minimum of space.

The Gerotor Air Cylinder can be used



Gerotor Air Cylinder

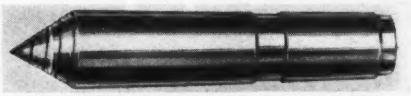
for 150-lb. air or 300-lb. oil and water service. When used for oil hydraulic service, the cylinder can be obtained with an auto type piston ring construction. Self-adjusting composition packings are used for cups and piston rod. Additional features of the cylinder include large pipe connections, ample bronze rod guide, oversize alloy piston rod, heavy duty piston assembly, and heavy duty alloy covers.

The Gerotor Air Cylinder is available in seven standard mountings, in 12 diameter bores, and with any length of stroke.

CMD Helical Groove Center

According to an announcement made by Chicago Manufacturing and Distributing Co., Department MMS, 1928 W. 46th St., Chicago, Illinois, the CMD Helical Groove Center is now available with a cobalt-tungsten alloy tip which is said to assure "red hardness" on even the most difficult cutting operations.

The abrasion-resistant cobalt-tungsten alloy is torch welded onto the center tip,



CMD Helical Groove Center

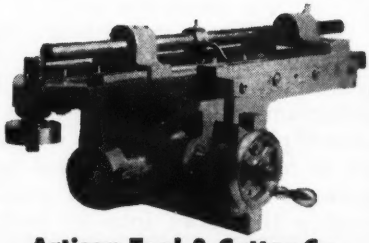
midway from the point, as illustrated. Torch welding fuses the red hardness al-

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The Reeve Taper and Profiling Attachment greatly simplifies the boring of tapers and profile holes with hand screw machines and turret lathes.

It does away entirely with the trial-and-error method. In one minute it can be set to any required diameter and taper—and the very first piece bored has the taper specified. The size and taper at the face of the stock are held the same from piece to piece, regardless of variations in the length of the stock.



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Reeve TAPER & PROFILING TURRET ATTACHMENT



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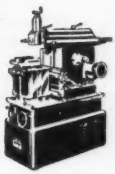
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QUALITY MACHINE TOOLS





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SETS INSTANTLY!



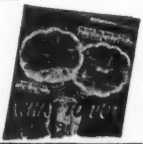
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No longer is it necessary for the busy plant to close off an area of concrete floor while waiting for newly installed patches to set. Flexrock offers a new plastic repair material which is ready for traffic almost the moment it's put down. Simply shovel INSTANT-USE into the hole or rut — tamp — and your floor is restored to solid smoothness . . . back in service without delay. Tough INSTANT-USE bonds tight to old concrete, makes long-lasting heavy duty patch. Withstands extreme loads. Keep a drum on hand for emergencies. Immediate shipment.



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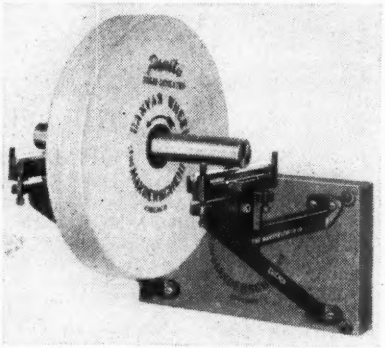
Company .....

Address .....

loy with the steel base of the center, thus assuring unusual rigidity and long center life.

"Presto" Static Balancer

An improved static balancing machine developed especially for polishing wheel service has been added to its "Presto" line by The Manderscheid Co., 605 W. Washington St., Chicago 6, Ill. Durably built and arranged for convenient out-of-the-way mounting on a wall or post, the unit includes ways that are made of deep hardened steel and are ground and honed to razor straight edges. Each way is provided with a spirit level and finger-tip precision leveling adjustment



"Presto" Static Balancer

to allow for maintenance of maximum accuracy.

The Presto Static Balancer is furnished with a base for wall or post mounting and is designed for balancing wheels up to 18 inches in diameter. Ways are 10 inches between centers.

Kleer-Flo Metal and Plastic Parts Cleaner

Marketed by the Kleer-Flo Co., Dept. 2-L, 250 W. 57th St., New York 19, N. Y., the electrically-operated metal and plastic parts cleaner shown herewith is said to quickly and safely remove oil, grease, and filth from 300 lb. of metals or plastics at one time within 10 minutes.

According to the manufacturer, the

PALMGREN

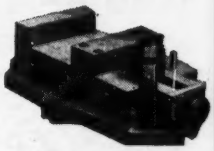
ANGLE—DRILL PRESS—PRODUCTION VISES



No. 000 ANGLE VISE—Swivel Base

ANGLE VISES — For Milling, Drilling, Grinding, Filing, Fitting, etc. Solve difficult angle jobs. Quick accurate set-ups without clamps, wedges or make-shift methods. Accurately machined and graduated. Hardened steel jaws, plain or grooved. 1½" to 8".

DRILL PRESS VISES — Accurately machined. Best semi-steel castings. Long bearing and adjusting screw. Jaws hardened steel—plain or grooved. Sizes 1½" to 4".

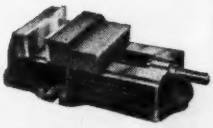


HEAVY DUTY PRODUCTION VISE



No. 250 MILLING ATTACHMENT VISE—2½" JAWS

MILLING ATTACHMENT VISE—Just the fixture for milling operations on lathes. Fits 8"-9"-10" South Bend, Atlas, Craftsman, Sheldon, etc. Graduated vertical feed screw and 360° graduation for vertical angle adjustments. Mounts on cross slide and held by T-slot bolt. Vise has 2½" jaws 1-7/16" deep grooved and plain. $24.75.



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HEAVY DUTY PRODUCTION VISES—For fast, heavy work. Adjustable cam locking lever. Movable jaw, hardened and ground. Sizes 3" to 8" Jaws.

FLANGED MILLING MACHINE VISE—Clamps to table of milling machine, grinder, etc. Jaws hardened and ground. 6" wide, 2" deep.



DRILL PRESS VISE

Write for Circular 348

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BUILDERS 'T' SURFACE GRINDER



THE "EAGER BEAVER" *of the Toolroom*

Fussy grinding jobs can't faze this willing little worker. Builders hand operated 'T' Grinder, small in size, does the work of large, expensive machines. Surprising capacity . . . dies, tools and parts up to 4" wide, 8" long and 10" high can be accurately ground with an excellent finish.



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"YANKEE" SPIRAL SCREW DRIVER No. 130A
A Size for Every Purpose

Vast throngs of new shop workers, trained in war industries, have been using "Yankee" Fine Mechanics' Tools for the first time . . . mastering fresh trade skills which will stand them in good stead in the peace years to come. They have learned what skilled mechanics and old-time factory men have long known . . . that "Yankee" Tools complete innumerable tasks *faster, easier,* and *better.* Because of the great demand for these tools during the war emergency, your dealer may not always be able to take care of your needs, but keep asking for "Yankee" by name. For half a century, the ingenuity of "Yankee" Tools has set a high record in speed and accuracy. The war has served to underscore that record.

Order from your industrial supply distributor, or write North Bros. Mfg. Co., Dept. MMS-745, Phila., Pa.

"YANKEE" TOOLS
make good mechanics better
North Bros. Mfg. Co., Phila. 33, U. S. A.
Established 1880

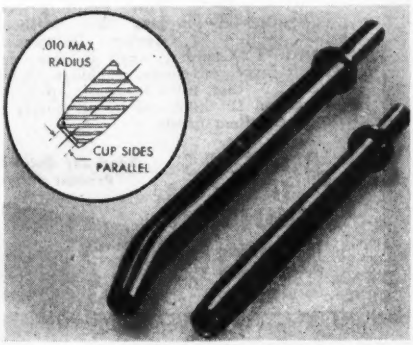
solvent employed is automatically filtered while the machine is in operation and is used over and over again unimpaired by foreign matter. A fuseable link on the cover of the machine causes the cover to snap shut in case of fire, thus snuffing out the flames.



Kleer-Flo Metal and Plastic Parts Cleaner

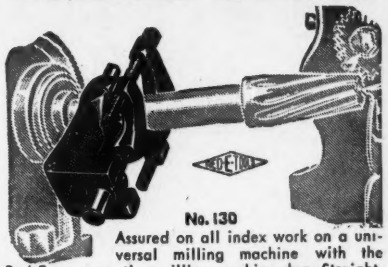
Aero Improved AN 442 Rivet Set

An improved rivet set for the hard-to-work, flat head, AN 442 rivets is announced by the Aero Tool Co., Burbank, Calif. The set is made with cup coined for dimensions accuracy, with the result that cup sides are uniformly



Aero Improved AN 442 Rivet Sets

ACCURATE SPACING



No. 130
Assured on all index work on a universal milling machine with the Red-E compensating milling machine dog. Straight, spiral or tapered work indexed without binding, cramping or lost motion.



Write for Catalog S-45

THE READY TOOL CO.
510 Iranistan Ave.
Bridgeport, Conn.

Why Use A Shaper
to cut Keyways when a

DAVIS KEYSEATER

will do the job so much quicker and better?



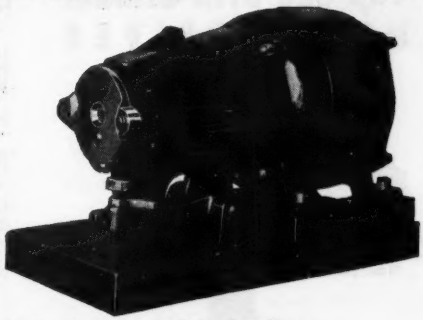
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DAVIS KEYSEATER CO.
Exchange and Glasgow Sts.
ROCHESTER, N. Y.

SAVES TIME — SAVES MANPOWER and INCREASES Production!

That's what the PRECISION WIRE STRIPPER is doing today for hundreds of war production plants throughout the U. S.—AND IT WILL DO THE SAME THING FOR YOU if wire stripping problems now confront you.

In a twinkling, this ruggedly built precision instrument removes insulation from the ends of solid, stranded or multi-conductor cable and wire up to a half inch in diameter AND IT DOESN'T REQUIRE A SKILLED OPERATOR.



Drop us a line now and we'll send you complete details on **THE PERFECTION WIRE STRIPPER** *by return mail.*

WEBER MACHINE CORPORATION

59 Rutter St. **Rochester 6, New York**

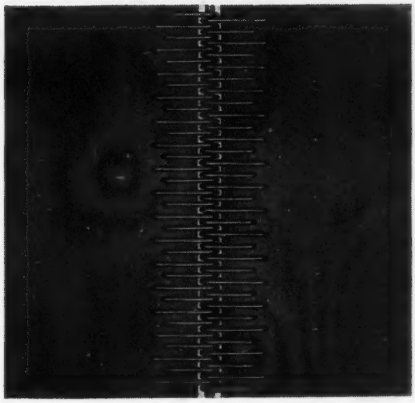
parallel and the radius at the cup base is held to a maximum of 0.010 inch.

The coined AN 442 cup is available in all standard sizes of both straight and offset rivet sets.

Bristol Wire Belt Hooks

The Bristol Co., Mill Supply Division, Waterbury 91, Conn., announces the addition of a line of hinged-type wire belt hooks to its line of belt lacing products. The hooks are designed for joining all types of flat belting, including leather, fabric, rubber, and balata belts. Various sizes are offered for application to belts up to ⅝-inch thick.

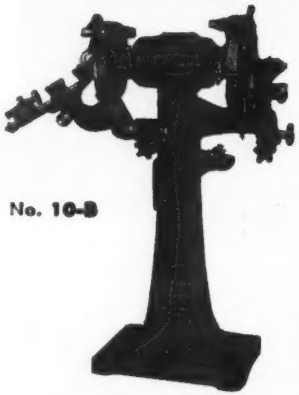
A unique method of mounting the hooks in the spacer card permits the card to be left in place in the lacing machine during the lacing operation. The hooks are thus said to be held in accurate alignment until the hook points pierce the belt. Not until after the lacing operation has been completed is the card removed. This method of carding is claimed to ensure uniform spacing of the hooks and to result in an even distribution of pull over the width of the belt.



Bristol Wire Belt Hooks

The Bristol Wire Belt Hooks are designed in such a manner as to enter the belt in two rows with each opposite point passing into the belt in alternate rows. The purpose of this arrangement is to eliminate interference between opposite hook points as they are pressed

GRAND RAPIDS
Combination
Tap and Drill Grinder
MOTOR DRIVEN



No. 10-B

SHARPENS TAPS No. 6 to 1½"
2-3-4 Flute, Right or Left Hand.

SHARPENS DRILLS ⅛" to 1½"
2 or 3 Flute, Straight or Taper Shank.

Other Combinations also available.

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336 Straight Ave., S. W. • . Grand Rapids 4, Mich.



The *Johnson* MOLD and LADLE!

Wherever a blow must be struck without marring the work, lead hammers are an absolute necessity!

To assure a continuously adequate supply of SAFE-TO-USE lead hammers, use the Johnson Mold and Ladle and mold your own. Send for illustrated folder and price list. Address Dept. M-4.

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STANDARD D-4 Abrasive Band Grinder

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. 4x36¼" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW MANUAL ON FINISHING—WRITE TODAY

WALLS SALES CORP.
96 Warren St., New York, N. Y.

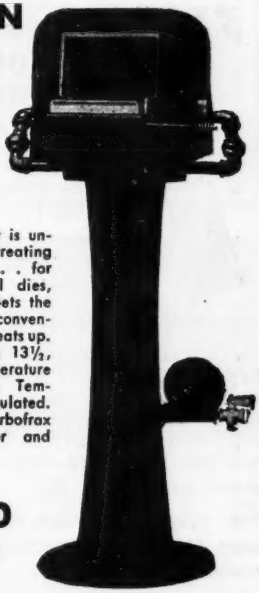
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Reaches 2300° F. in 30 Minutes from a COLD START!

Hardens high-speed steel tools, dies and small parts quickly and economically.

JOHNSON No. 120

1500° F. in 5 Minutes!



A low cost unit that is unexcelled for heat-treating high-speed steels . . . for hardening any steel dies, punches or tools. Gets the job done before conventional-type furnace heats up. Firebox 5 x 7¾ x 13½, lined with high temperature insulating refractory. Temperatures easily regulated. Complete with Carbofrax hearth, G.E. Motor and Johnson Blower.

$129.50

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Please send me Free Johnson Catalog.

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LATHE CENTER LUBRICANT
STOPS • WEAR
• SCORCHING
• BURNING
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It will pay you to keep a tube by every lathe in the shop. And to use it for other hot-spot lube problems where extreme film strength is required.

DIXON'S GRAPH-AIR GUN TYPE 4

Filled with Microfyne graphite, it's the slickest gadget you ever saw for lubricating locks and other hard-to-reach mechanisms, in shop, office, car, boat, home. Read Data Sheet #8. Buy a gun at your supply house. 30¢.



Write Graphite Gus today for the Dixon Data Sheet Directory. It lists 20 famous graphite products.

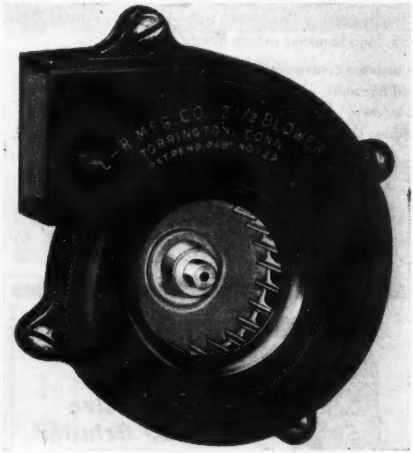
JOSEPH
DIXON
CRUCIBLE COMPANY

Div. 2C7 Jersey City 3, N. J.

into place and also to distribute the grip on the end of the belt over a wide area.

L. R. Model No. 2½ Blower

The L. R. Manufacturing Co., Division of The Ripley Co., Torrington, Conn., announces the addition of a lightweight blower for heat dispersion to its line of blowers ranging in sizes from 3 to 6½ inches with weights from 2 to 12 oz. and capacities from 15 to 270 c. f. m. at 8,000 r. p. m. Designated as the Model No. 2½, the blower features a one-piece, high impact, phenolic plastic housing with aluminum motor plate, the housing measuring 4½ inches from top to bottom.



L. R. Model No. 2½ Blower

Said to operate equally well under all conditions of climate and temperature, the L. R. Model No. 2½ Blower weighs 3½ oz. and is designed to deliver 50 cubic feet of air per minute at 8,000 r. p. m. It is available with shaft bores of either 0.1895 or ¼ inch. The wheel of the unit is of the turbo type and is made of cadmium plated steel. It is available for either clockwise or counterclockwise rotation.

Elliott Unit Drive

Manufacture of auxiliary flexible shaft equipment designated as the Unit



Light—no other method can give

AXCESS LIGHTS adjust instantly to direct light for maximum vision, eye comfort and accuracy at every step in machine or bench work. Rugged; few changeable parts make fixtures of needed reach and stability for machines of varied sizes. Overcomes eye fatigue and improves quality. Increases production otherwise impossible when projected light and eyes must be within 18 inches of essentials to see them.

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7-9 Liberty Square **Lynn, Mass.**

MARK IRON, STEEL and CARBIDES



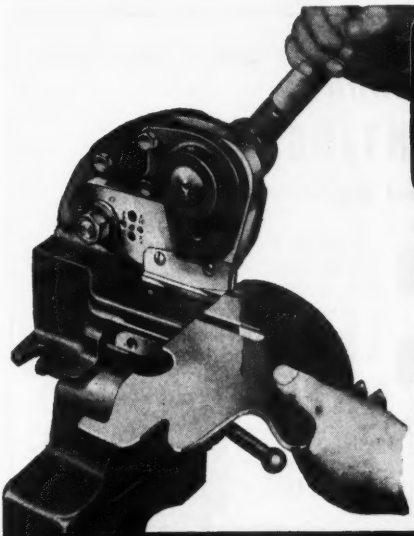
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Mark *hardened parts*, tools, dies, gages and fixtures of any ferrous metals including the hardest alloys and carbides — quickly — plainly. • Three sizes to meet all requirements. • Also a combined Etchograph and Demagnetizer.

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MINUTE-MISER
OF THE
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THE HEINRICH HEAVY DUTY

HANDNIB

A tool for shearing, nibbling and rod cutting. Cuts irregular sheet metal shapes quicker and better. Capacity, 3/16" flat stock—3/16", 1/4", 5/16" and 3/8" round stock.

An ideal machine for Toolrooms, Machine Shops—also for Pattern or Experimental Work.

Prompt Delivery
Ask for Descriptive Folder

NATIONAL MACHINE TOOL CO. HEINRICH

THE NATIONAL MACHINE TOOL CO.
1536 CLARK STREET • RACINE, WISCONSIN

Drive is announced by the Elliot Mfg. Co., 514 Prospect Ave., Binghamton, N. Y. The Unit Drive is so designed that



Elliott Unit Drives in Use

it may be readily attached to any standard electric motor, thus making available an efficient flexible shaft machine.

According to the manufacturer, the Elliott Unit Drive can be used for sanding, polishing, cutting, grinding, and finishing operations, and will operate any of the many flexible shaft attachments available.

Bruning 2401 Pocket Slide Rule

Designated as the Bruning 2401, a high-quality 5-inch pocket slide rule for engineers is now being offered by the Charles Bruning Co., Inc., New York, N. Y. A carefully made, smooth working instrument designed for fast, easy operation, the slide rule features precision graduations which are molded in the rule to retain their visibility over a long period. Graduations and numerals on the CI scale are in red to facilitate reading.

Three screws in the back of the rule provide a simple adjustment for tension on the slide. The indicator is of glass and is easily replaceable in the event of breakage. The indicator is enclosed in a frame of stainless steel which holds it firmly in place and eliminates "wobble." A, B, CI, C, D, K, S, L, and T scales are provided on the rule in order to

FOR HIGHEST GRINDING WHEEL EFFICIENCY DRESS AND TRUE REGULARLY WITH

VINCENT-HUNTINGTON

***New Improved Grinding Wheel* DRESSERS *and* CUTTERS**



★ Proper care of grinding wheels will insure greater production as well as highest grinding wheel efficiency. The chart below will help to give correct size of dresser for a good job:

- Use No. 0 Dressers on Wheels up to 1½" Face.
- Use No. 1 Dressers on Wheels up to 1⅝"—2" Face.
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- Use No. 11 or No. 22 Dressers on Wheels of extra wide Face.

Send for Catalog sheets.



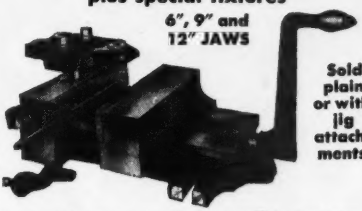
"If it's a HUNTINGTON Dresser or Cutter . . . VINCENT makes it."

THE VINCENT STEEL PROCESS CO.

2434 Bellevue Ave.
DETROIT, MICHIGAN

An Excellent Plain Vise—plus special fixtures

6", 9" and 12" JAWS



Sold plain or with jig attachments

As a plain vise, the flush, parallel, four-square construction has many advantages. The optional Jig Attachments permit various special-holding and repeat-operation jobs.

GRAHAM MULTI-PURPOSE VISE

KNURL HOLDER FITTING LATHE TURRET

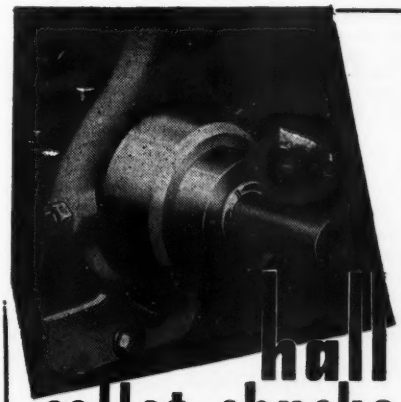


With work capacity up to 2½" dia., this "Adjust-angle" tool produces many patterns of knurling using the same pair of straight knurls.

Request Illustrated Price Circulars

GRAHAM MFG. CO.

38 Bridge Street **East Greenwich, R. I.**



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All grip—no slip . . . no bearings, friction, heat or lost power . . . push out type . . . full spindle capacity or over . . . automatic adjustment . . . work re-set without stopping lathe . . . 2 sizes, 1" and 2" capacities . . . order now with proper priorities.

immediate deliveries.

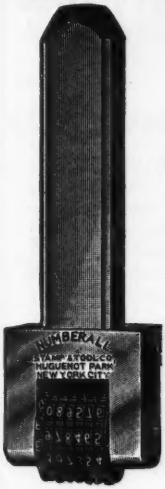
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Ph. NO 9679

622 Tularosa Dr. **Los Angeles 26, Cal.**

NUMBERALL

Multi-Wheel Numbering Machine Model 70



The most efficient method of stamping numbers into metal. Repeats the same numbers until changed. Model 70 NUMBERALL Machines are used in all industries to mark various parts. Stamps numbers, etc., quickly . . . neatly. Perfectly aligned. Much better marks are produced by these machines than by single stamps or steel type, and at a far lower cost. Shank for Hand or Press and with any number of wheels from 3 to 20.

Model No. 70

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Improved Type Holders, Hand or Press Style. Super Quality Steel Type.

Type is easily, quickly, loaded and unloaded. Simplest construction. A pin holds the type securely. No screws nor springs. Made in various sizes: 1/32" to ½" figures and letters.



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NUMBERALL STAMP & TOOL CO.

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Immediate Delivery!

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H.S. DRILLS 9" FLUTE H.S.



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13/64"	2.34
7/32"	2.45
15/64"	2.54
1/4"	2.63
17/64"	2.73
9/32"	2.82
19/64"	2.93
5/16"	3.02
21/64"	3.18
11/32"	3.36
23/64"	3.56
3/8"	3.75
25/64"	3.95
13/32"	4.14
27/64"	4.29
7/16"	4.49
29/64"	4.62
15/32"	4.76
31/64"	4.85
1/2"	4.88

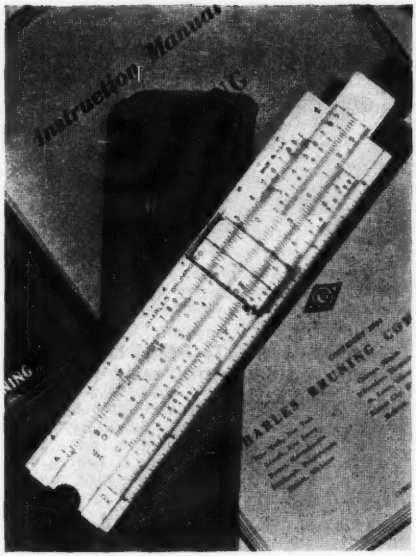
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EASTERN TOOL SUPPLY CO.

176 GRAND STREET

New York 13, N. Y.

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Bruning 2401 Pocket Slide Rule

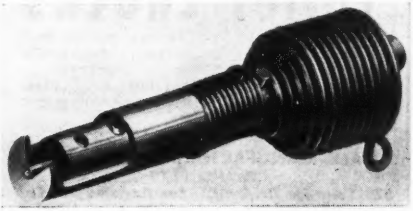
adapt it to the widest possible range of service. The beveled edges of the rule are in graduated scales of both inches and centimeters..

The Bruning 2401 Pocket Slide Rule is supplied complete with a natural leather case and instruction booklet.

Topflight Rivet Remover

Intended primarily for the aircraft industry, a tool which is said to provide for the quick removal of rivets without enlarging holes or distorting airplane skins has been placed on the market by the Topflight Tool Co., Chestnut Ave., Towson 4,

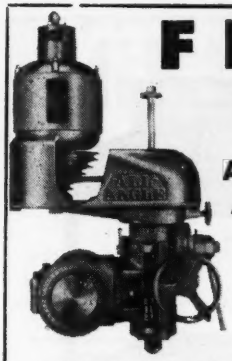
Topflight Rivet Remover



FRAY

TYPE D MILLING ATTACHMENT

Available Now!



- ✔ Quill type, balanced, "All Angle", precision head.
- ✔ Designed to do work to closest possible limits. Accuracy guaranteed.
- ✔ Squaring faces on housing — Instantaneous shifting from wheel to lever feed.
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Manufacturers of All Angle Milling Attachments

Milling Machines · Offset Boring Heads · and Boring Bars

NEW DIE GRINDER ADDED TO KELLER LINE



MANY IMPROVED FEATURES

25,000 Rpm. Increased-power pneumatic die grinder. Compact, one-piece housing. Holds 8-hour oil supply. Special air-cooled cylinder. There's a Keller Die Grinder to meet your needs. Write for Catalog No. 11.

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Pneumatic Tools

KELLER TOOL COMPANY, 4507 MILTON STREET GRAND HAVEN, MICHIGAN

MOTORIZED HOPPER UNITS

ADAPTABLE TO ANY MACHINE.

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FEED BULLET CORES, SCREWS, PINS, WASHERS, BEARING ROLLERS, NUTS, RIVET, SPECIAL PARTS.

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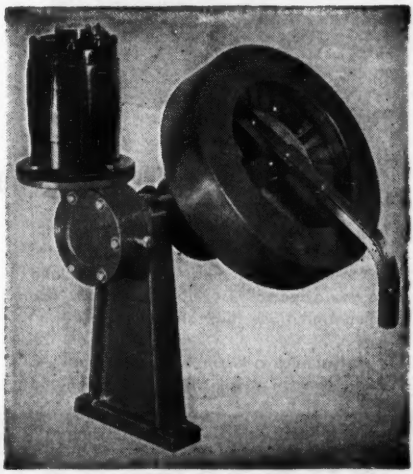
Send Samples for Information and Prices.

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DETROIT POWER SCREWDRIVER CO.

2807 West Fort St.

DETROIT 16 • MICHIGAN



Md. The tool is supplied complete with a two-way bucking bar and is designed for attachment to any standard automatic rivet gun, the pulsating action of which is said to operate the rivet removing tool without effort on the part of the worker.

The Topflight Rivet Remover is available in standard sizes for removing ⅛ and 5/32-inch rivets and in special models for removing rivets of any other size.

Lyon Portable Steel Desk

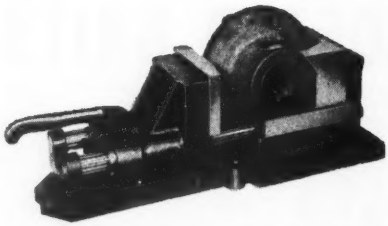
A sturdy portable steel desk especially adaptable for shop foremen, shipping clerks, inspectors, dispatchers, and so on, is now being marketed by Lyon Metal Products, Inc., 139 Clark St. Aurora, Illinois.

The Model No. 2131-15 shown herewith is equipped with 3-inch swivel casters and a positive brake attachment. The overall size of the unit is 34½ inches wide x 30 inches deep x 53 inches high (43 inches high in front). The desk hood provides adequate space for the storage of working papers and has a smooth 30-inch top with a 3-inch overall slope. The spacious drawer, 24 x 28 x 3½ inches in size, is equipped with a lock for the safekeeping of important papers.



Lyon Portable Steel Desk

Other steel desks available include a counter type (no legs); cabinet type;



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This Vise Will Do the Work . . . Lots Cheaper!

When you have a milling or drilling job that you thought would require a special fixture, here's a simple way out! Let us design and build you a special vise, using the Presto-Vise Holding Unit. (See illustration above).

The cost of such a vise is surprisingly low—a fraction of what a special fixture costs—and it can be made in a fraction of the time, enabling you to get into production much more quickly.

If you will send us a part print, we will gladly submit a cost estimate. No obligation. Write for circular on complete line of Presto-Vises.

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GOOD GEARS ONLY

All Kinds—Any Quantity

AT THE RIGHT PRICE

THE CINCINNATI GEAR CO.

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PUNCHES and DIES

TO FIT ALL MAKES OF PUNCH MACHINES

Large range of round, square, flat, and oval sizes are carried in stock for immediate shipment. Special Tools Made To Order.

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Catalog No. 8 Available.

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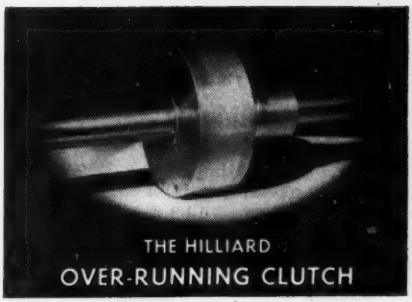
Over 4,000 shapes, cuts and sizes of both Swiss and American patterns.

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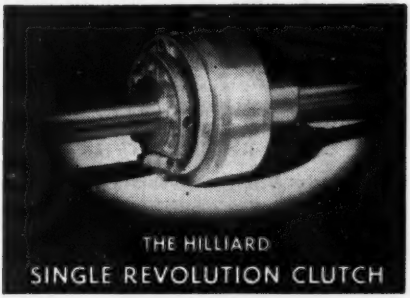
Carson - Newton Co.
61-71 MILL ST.
BELLEVILLE, NEW JERSEY





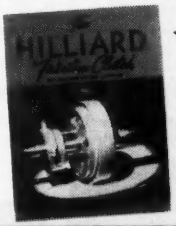
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OVER-RUNNING CLUTCH

A "Free Wheeling" Clutch of simple design recognized for many years as "Standard Equipment" for Automatic Dual Drive operation—Automatic operation of 2 Speed drive—As a ratchet permitting infinite adjustment and as an automatic backstop. Furnished in a number of types.



THE HILLIARD
SINGLE REVOLUTION CLUTCH

Wherever extremely accurate control of intermittent machine operation is essential the Hilliard Single Revolution Clutch is unequalled. Its accuracy has won for it the acceptance of Industry for cutting, punching and packaging operations.



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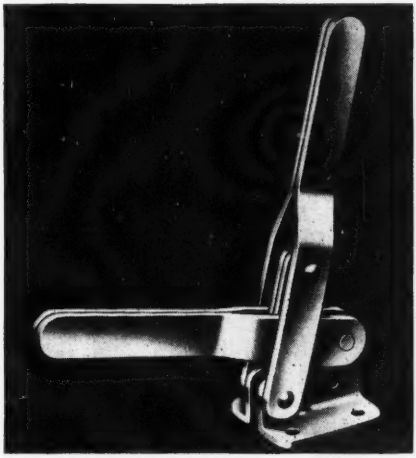
For the new series of 6 illustrated Bulletins furnished FREE upon request. Featuring our complete line of Industrial Clutches and Couplings—Over-Running—Single Revolution—Friction—Centrifugal—Overload Release—Slip.

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117 W. 4th St. ELMIRA, N. Y.
Manufacturers of
INDUSTRIAL CLUTCHES

desk high type; stationary type; and a type for fastening to the wall.

Knu-Vise Model KV-221 Toggle Clamp

Designated as the Model KV-221, a toggle-action clamp which is especially applicable where unusual pressure is required for clamping at an angle to the base mounting has been placed on the market by Knu-Vise, Inc., 2201 8th St., Detroit 16, Mich. The clamp can be used to advantage inside of jigs where operating space may be limited. It can also be used as a locating device in progressive drilling fixtures.



Knu-Vise Model KV-221 Toggle Clamp

The Knu-Vise Model KV-221 Toggle Clamp weighs 23 oz. and measures 7⅛ inches in height and 6⅛ inches in length. Its recommended load at the end of the standard toggle bar is 240 pounds.

Wright-Austin "Kleervu" Safety Guard

Described as combining the utmost in worker protection with the important feature of unobstructed visibility, a transparent safety guard to be known as the "Kleervu" is now being manu-

ARTUS ARBOR SPACERS

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The COLOR tells the THICKNESS

ARTUS Arbor Spacers made of plastic in various colors identify thickness at a glance! .001, .0015, .002, .003, .005, .0075, .010-.030. Speed up accurate fitting at low cost. Write for folder.

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100 SPACERS IN ALL

⅞" — $2.80 1¼" — $3.40
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Illustrated Folder Free.
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SAVE THOSE OLD TAPS. REGRIND THEM

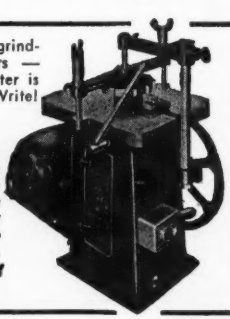
Used on tool and cutter grinders — surface grinders — even bench lathes. Taps sharpened after center is destroyed. No collets. Complete. No extras. Write!



RESHARPEN DULL TAPS PROMPT DELIVERY.

BROACH KEYSEATER

The Reading Bench Machine does not require bushings or guides. Very fast capacity from ⅛ to ⅜ cutter. Low first cost.



READING MACHINE COMPANY
READING (CINCINNATI), OHIO

LUMA

Patented



Combination Demagnetizer and Electric Etching Pencil. Marks symbols in hardest steel. Demagnetizes instantly.

One of our models popular in tool rooms for 15 years.

Luma Electric Equipment Co.
DEPT. MS **TOLEDO 1, OHIO**

GRANT RIVETERS



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THE GRANT MFG. & MACHINE CO.
96 Sillman Ave. **Bridgeport 5, Conn.**

BALANCING WAYS

Shops handling rotating parts find this simple, sturdy and thoroughly dependable device highly efficient for balancing and truing operations. It assures better work...saves time...saves labor. No leveling required.



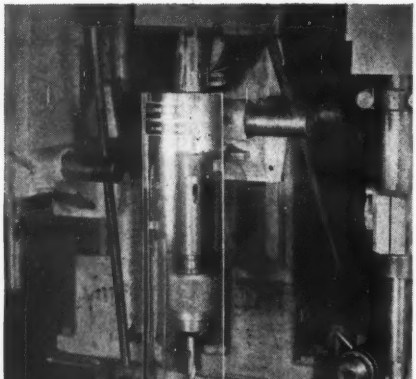
Four chilled iron discs rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.

Swing	Greatest Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000

Send for BULLETIN 7-22

ANDERSON BROS. MFG. CO.
Anderson
ROCKFORD, ILL. U.S.A.

Buy More BONDS



Wright-Austin "Kleervu" Safety Guard Installed on Drill Press

factured by the Wright-Austin Co., 346 W. Woodbridge St., Detroit 26, Mich. The guard is so designed that sparks, metallic particles, splashing liquids and the like are not permitted to come "into the open" but are curtained by an invisible, chip-proof barrier.

The Kleervu Safety Guard is made of a heavy gauge clear plastic of unusual toughness and high resiliency. According to the manufacturer, the plastic can be readily sawed or drilled, yet moulded into practically any shape or contour. The guard is available in a number of standard sizes and can also be obtained in special sizes or shapes to fit any machine.

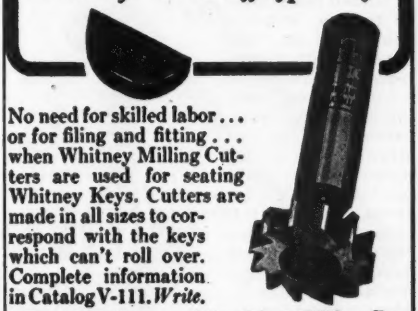
Amcoweld Plasti-Goggle

A safety goggle which is designed to afford undistorted and unrestricted vision together with maximum protection against impact hazards, to be known as the Amcoweld Plasti-Goggle, is now being manufactured by the Eastern Equipment Co., Inc., Willow Grove, Pa. The goggle is made of one piece clear Plexiglas which, it is claimed, has the same qualities as the finest optical glass, thus enabling the goggle to be worn all day without eye strain or fatigue.



WHITNEY MILLING CUTTERS

for Uniform Seating of Whitney Woodruff-type Keys

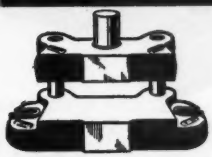


No need for skilled labor . . . or for filing and fitting . . . when Whitney Milling Cutters are used for seating Whitney Keys. Cutters are made in all sizes to correspond with the keys which can't roll over. Complete information in Catalog V-111. *Write.*

The Whitney Chain & Mfg. Co.

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Machined Steel — Semi-Steel

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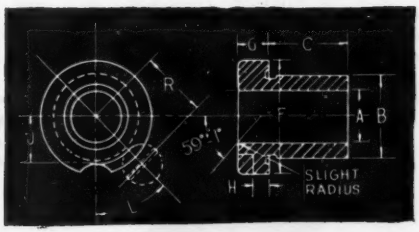
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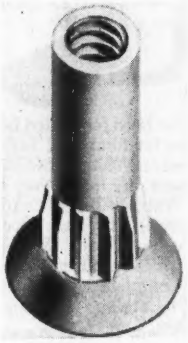


Amcoweld Plasti-Goggle

The lens area extends in an unbroken curve from temple to temple without corners or sharp bends. According to the manufacturer, the Amcoweld Plasti-Goggle is spatter resistant, light in weight, and, due to the smoothly rolled edges and ¾-inch wide full elastic headband, comfortable to wear.

Goodrich Splined Rivnut

A Rivnut of the splined type suitable for use in plastics, leather, hard rubber, and other materials where nuts must be firmly anchored for attaching accessories is announced by The B. F. Goodrich Co., Akron, Ohio. The splines, which are located beneath the countersunk head of the unit, are intended to afford resistance to torque, while the bulge or "upset," which forms below the ends of the splines, provides tension resistance. The splined Rivnut is thus locked into place in two ways. Internal threads left intact within the Rivnut shank are designed to accommodate an attachment screw for installation of accessories.



Goodrich Splined Rivnut

The Goodrich Splined Rivnut can

DESMOND GRINDING WHEEL DRESSERS



Desmond Hex Dresser



Desmond Heavy-Duty Dresser



Desmond Huntington Dressers

Our Desmond Huntington Cutters are made in all sizes.



We manufacture only complete line of dressers and cutters on the market, and will be glad to send samples for trial. Write for copy of our new catalog and name of your nearest jobber.

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KEO

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Precision made, of tool steel, hardened and ground. Tapered .0005" to one inch. Diameters from $\frac{3}{16}$" to 1", .0005" undersize at small end; from $1\frac{1}{16}$" to 3", .001" undersize at small end. Specials made to your specifications.

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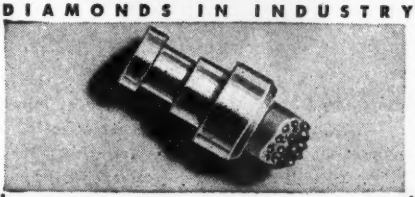
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For roughing and semi-finishing operations with wheels of harder or coarser bonds, JKS Impregnated Diamond Tools are highly satisfactory. A sintered carbide matrix holds the 60 small whole diamonds until entirely consumed.

For finishing operations, single point diamond tools are recommended.

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J. K. SMIT & SONS, Inc.

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GRIFFIN Soft Center

HARD-TEMPERED along the back — for reserve strength and stiffness where needed. Softer—but TOUGH—through the center, for flexibility and break-resistance. Extra hard teeth—for sure cutting and long service. A many-purpose blade, exclusive with Griffin. Widest possible range of uses.

Ask for it at your local Griffin distributor's. See also Griffin High Speed Steel Blade for toughest alloys; Griffin Molybdenum High Speed Steel, most economical cut-off tool obtainable today; Griffin Non-Strip hand blade for cutting thinnest sheet or tubing.

General Sales Agent

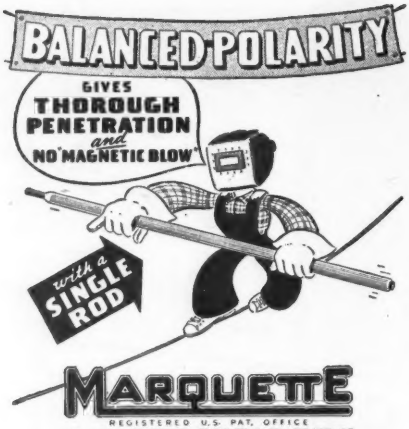
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A.C. ARC WELDERS

The unbeatable combination of Thorough Penetration and Perfect Arc Control, both at the same time and with a *single* rod, is yours with Marquette A.C. Arc Welders. No question of straight or reversed polarity. Always the same accurately regulated, matchless welding power. The complete absence of "Magnetic Blow" saves time and tempers, especially when working in close quarters.

MODERN MACHINE SHOPS

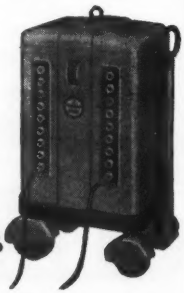
Marquette A.C. Arc Welders are indispensable in Modern Machine Shops for inexpensively hardsurfacing the working edges of tools, dies and cutters, thereby saving critical metals. Ideal for repairing broken tool surfaces without dismantling.

Marquette's versatility permits easy fabrication of gauges, jigs and fixtures built from every type and size of metal. Eliminates laborious, unnecessary sensitive layout work.

10 Models
125 to 400 Amps.
COMPLETELY
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Minneapolis 14,
Minnesota

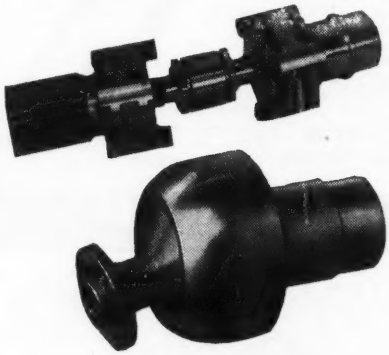


MARQUETTE
REGISTERED U.S. PAT. OFFICE
WELDING
Equipment
ELECTRODES AND SUPPLIES

be installed with the same type of tools regularly used for heading conventional types of Rivnuts in metal, however, the tools must be adjusted to accommodate the longer shank of the splined unit. The splined Rivnut is made in three sizes—6-32, 8-32, and 10-32—in aluminum or brass.

Geargrind Constant Velocity Universal Joints

The two constant velocity universal joints illustrated herewith have been added to the line of Geargrind products



Geargrind Constant Velocity Universal Joints

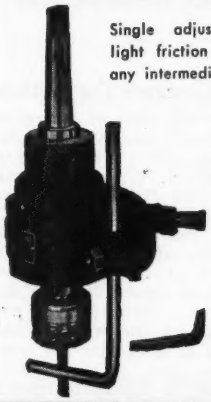
marketed by The Gear Grinding Machine Co., 3901 Christopher, Detroit 11, Mich. The joints are designed for operation at speeds up to 9,000 r.p.m. between shafts subject to a maximum deviation from normal of 6. At all speeds and at all angles of deflection the joints are said to deliver to the driven member the same constant speed of rotation that is provided by the driving member.

Special constant velocity universal joints for use where proper ratios between speed and angularity are essential to satisfactory, trouble-free operation can also be designed.

Aero Seal Hose Clamps

An all-stainless steel hose clamp especially designed for service where maximum corrosion resistance is required, to be known as the Aero Seal, is now

TAP HOLES 2-56 TO 1¼" WITH DORMAN *Tappers*



Single adjustment changes from light friction to positive drive or any intermediate.

No. 1 tapper, friction or positive, drives 2-56 to ⅜" tap in steel or any other material
No. 2 positive tapper drives ⅜" to ¾" tap in steel or any other material.
No. 3-A drives ½" to 1¼" in steel or any other material.

Delivery from Stock

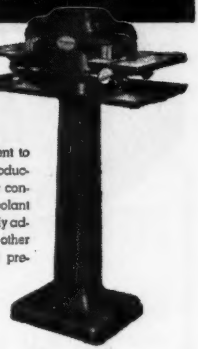
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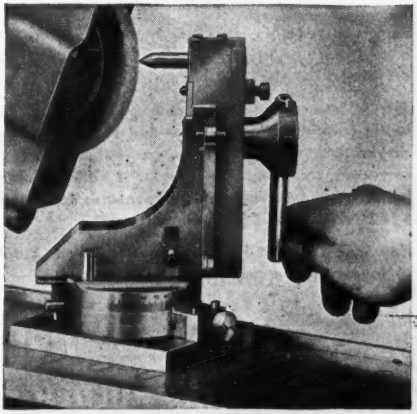
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ONE SETTING
HANDLE
CONTINUOUS MOTION

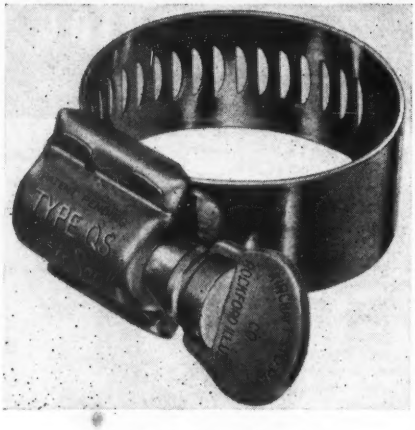
The J & S Model "E" Radii and Angle Dresser in the new "Fluid-motion" series is one of the finest precision dressing instruments procurable — regardless of cost.

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Automatic centering
14" wheel capacity
Large range yet compact
Chatterless and dustproof



J. & S. TOOL CO.
477 MAIN ST. E. ORANGE 5, N. J.



Aero Seal Hose Clamps

being produced by the Aircraft Standard Products Co., 1726 19th Ave., Rockford, Illinois.

Available in M12, M16, and M20, the clamp, in addition to including a stainless band that provides for unusual strength and flixibility, features a mechanically interlocked saddle that permits the elimination of welds. The clamp also features a smooth and powerful worm gear drive, compact housing, openable band, long take-up, uniform pressure action, and so on.

Wilkins Lens Cleaner Dispenser

In answer to the requests of industrial safety engineers for a handy and practical lens-cleaning unit, The Wilkins Company, Cortland, N. Y., has designed the cabinet type lens cleaner dispenser shown in the accompanying illustration. Compact in size, the cabinet contains a sprayer and bottle of K-LENS-M lens cleaner, a supply of special lint-free cleansing tissue, and space for the disposal of used tissue. The sprayer protrudes from the top of the wooden cabinet and is located in a corner for maximum convenience.

The lens cleaner is said to remove smudges of oil and grease, leaving no film to catch dust and lint. It is claimed to be particularly useful on safety goggles which are exposed to fine

Keep YOUR TAPS AND REAMERS IN SERVICE LONGER!

Taps and reamers that are apparently worn out can often be given a new lease of life by simply changing over from ordinary tool holders to the Ziegler Tool Holder.

This is because faulty tapping and reaming, resulting in oversize or bell-mouthed holes, may be due to inaccuracies in spindle alignment rather than to any fault in the tool itself. If so, the trouble can be corrected by using the Ziegler Floating Holder—a special type of holder that automatically compensates for spindle misalignment up to 1/32" radius or 1/16" diameter.

You will find that it is economy to buy a Ziegler Holder rather than to invest in new taps and reamers.



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1840 - 1945

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. . . because they're made of a special, correctly-heated alloy steel. Central striking point assures uniform marking. Thumb side marking assures easy use.

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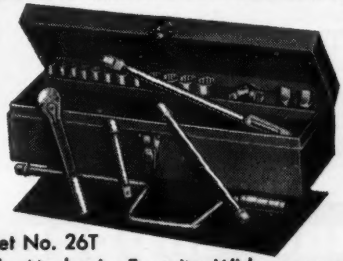
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To keep belts in service longer, use only GENUINE Clipper Belt Hooks applied with Clipper Belt Lacers.

use Clipper Belt Hooks

Clipper Hooks are made of the finest quality wire—BETTER than ever before—produced for our exclusive use. Hooks hold with firm, sure grip — give longer satisfactory service.



and Clipper Belt Lacers!



No. 9 Portable Lacer

The Clipper No. 9 Portable Lacer laces belts up to 6 inches wide in one quick, easy operation. Under powerful pressure hook legs are embedded flush with the surface of the belt and points clinched, making a perfect joint. Phone your mill supply jobber for a demonstration!

CLIPPER BELT LACER COMPANY, Grand Rapids 2, Michigan, U.S.A.

Clipper

SAVES VICTORY BY NOT INTERRUPTING PRODUCTION



Wilkins Lens Cleaner Dispenser

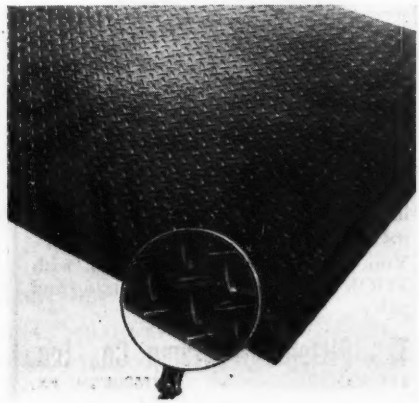
dust particle in the air. The cleansing tissue is specially designed to leave no lint.

"Ameritred" Matting

Known as the "Ameritred," a solid plastic friction type of matting which is made by firmly binding friction compound together with a plastic is now being marketed by American Mat Corp., 1796 Adams Street, Toledo 2, Ohio. The matting is designed to lie flat and to afford a non-slip surface.

Jet black in color, the Ameritred Matting is available in 29 x 63 9/64-inch, easily handled and easily cleaned sheets. To fit smaller or odd shaped

"Ameritred" Matting



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No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads . . . their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time . . . Money . . . Labor!

We also make silent gears of rawhide and Fabriol.

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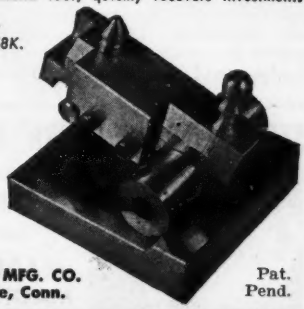
FOR CONCERNS CUTTING THEIR OWN GEARS, WE CAN MAKE IMMEDIATE DELIVERY ON BLANKS SAWED TO SPECIFIED DIAMETER AND FACE

THE *Greaves* MACHINE TOOL CO.
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Sine ANGLE WHEEL DRESSER

For faster, easier, more accurate dressing of surface grinder wheels . . . any angle 0° to 90° at plus or minus 10 seconds. Precision diamond tool, quickly recovers investment.

Send for Bulletin 758K.



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Plantsville, Conn.

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THE "FORM - MASTER"

ANGLE and RADIUS DRESSER

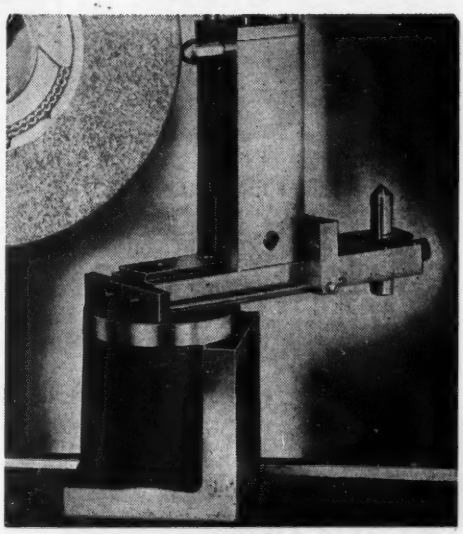
A sturdy, quality instrument designed by form-grinding specialists to dress both angles and radius at low cost. Two 1/3 ct. diamonds and instrument case included—$150.00 complete.

Features

- **Large range**
- **Chatterless and dustproof**
- **.0001" accuracy obtainable**
- **Simple to operate**
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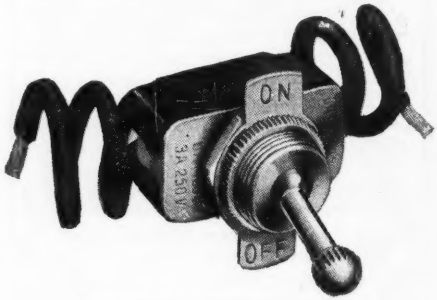


areas, the matting can be trimmed accordingly. The matting is said to be so constructed that swelling due to exposure to various types of oils is reduced to a minimum.

McGill Toggle Switch

A small toggle switch that is expected to find wide acceptance among small tool and appliance manufacturers has been developed by the McGill Mfg., Co., Inc., Electrical Division, 1500 N. Lafayette St., Valparaiso, Ind. The switch is also said to be very practical for the individual control of lights in Pullman and passenger cars, airplanes, trailers, camera projectors, and so on.

Approved by Underwriters' Laboratories, the McGill Toggle Switch is claimed to feature dust and vibration-proof construction and has a body size of 1 inch x ½ inch wide x ½ inch thick. The switch is made in three types: (1) No. 24 single-pole, rated 6 amp. "T" 125 volts, 3 amp. 150 volts; (2) No. 27 three-way, rated 6 amp. 125 volts; (3) No. 28 two-circuit, no off position, rated 6 amp. 125 volts. All types are furnished with wire leads or solder lugs.



McGill No. 25 Toggle Switch

Threadwell Tap Selector

A handy slide-rule type vest-pocket size tap selector is now being offered by Threadwell Tap & Die Co., Greenfield, Mass. Sturdily made of soilproof celluloid, the selector provides the necessary information concerning the proper tap, lubricant, and tapping speed to employ in performing a par-

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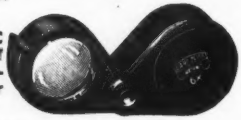


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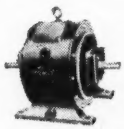
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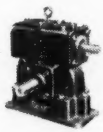
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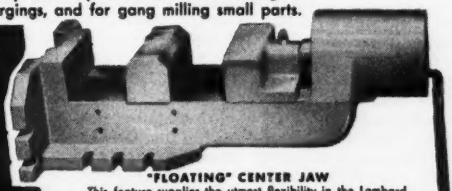
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Fast operating...has weight & rigidity... adaptable to production runs on castings & forgings, and for gang milling small parts.



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Eliminates Expensive Mill Fixtures and Costly Setups—which soon pay for your Lombard Vise

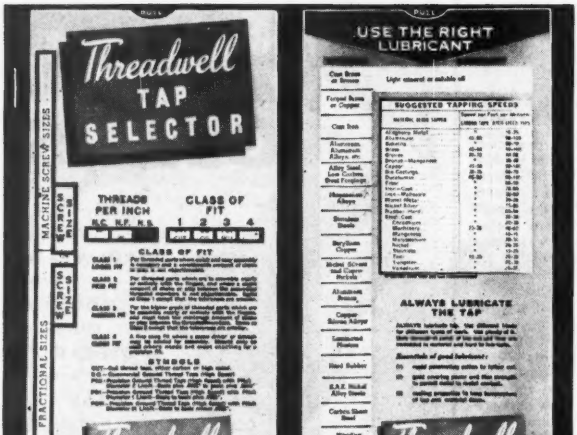
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This feature supplies the utmost flexibility in the Lombard Air Vise. Use the one jaw supplied or additional jaws depending only on the size of the parts to be held within the 12" span of the jaw.

SPECIAL JAWS TO HOLD UNUSUAL SHAPES
Special attachments or jaws may be made in your own tool room, or the Lombard Machine Company will manufacture them either to sample parts or to your prints and specifications.

SPECIFICATIONS
Overall length, 29½"—Overall width at base, 15"—Height, base to top of jaws, 7⅛"—Weight, 185 pounds—Depth of jaws, 3⅛"—Width of jaws, 7". Jaw Capacities: Two openings, each 4⅛", using center jaw furnished—Open capacity 0" to 12". Pressure Ratio: Twenty times air line pressures. 100 pounds air pressure develops 2000 pound squeeze—Working line pressure tested to 250 pounds. Material: Meehanite metal castings, machined to close tolerances. Valve, air lines and gages furnished with vise.

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ticular tapping operation.

For example, should the user desire to cut Class 3 fits for a ⅝-inch size screw, 16 threads per inch, N. C., in cast iron, he simply sets the tap selector to the cutting size and automatically obtains the information in the space at the right of the selector that a Class 3 fit requires a precision ground No. 2 tolerance tap. Then, on the other side of the selector, he adjusts the slide to the material, cast iron, and reads that he should use a light mineral or soluble oil. On this same side he finds the suggested tapping speed for "Iron-Cast," which is 70 to 80 feet per minute.

Copy of the Treadwell Tap Selector is available to individuals addressing requests on their company letterheads, giving their title or position.

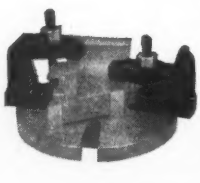
Carpenter Heat-Treating Guide

A heat-treating guide which is designed to provide in easy-to-use form complete information on the heat treatment of all Carpenter matched tool steels has been prepared by The Carpenter Steel Co., 311 W. Bern St., Reading, Pa. By means of the guide, the heat treater can find at a glance the following information for each steel: type analysis, forging heat, normalizing heat, annealing treatment, hardening treatment, furnace atmosphere, and recommended drawing range. In addition, he can determine for each steel on the chart the hardness for various drawing temperatures. By using the guide, the heat treater is said to be assured of controlling hardening behavior to exact specifications.

The Carpenter Heat-Treating Guide is offered free of charge to heat treaters, tool engineers, and toolroom foremen addressing requests on their company letterheads.

Dayton Rogers Countersink Gage

The Dayton Rogers Mfg. Co., 2849 Twelfth Avenue South, Minneapolis 7, Minn., now has available a gage for use in checking machine countersinks



Johnson Adjustable Work Clamps

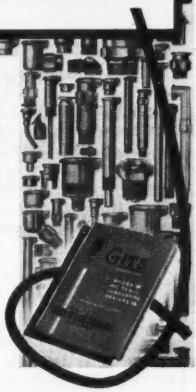
An all-purpose Clamp for lathes, milling machines, drill presses, and many other machines. Saves time and effort. Designed for speedy, accurate set-up and operating ease. Soon pay for their cost.

No. 1—⅜" Bolt. Capacity ½" to 2" from table or plate.
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Manufactured by W. E. JOHNSON CO., Pequannock, New Jersey

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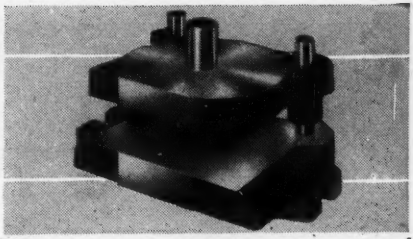


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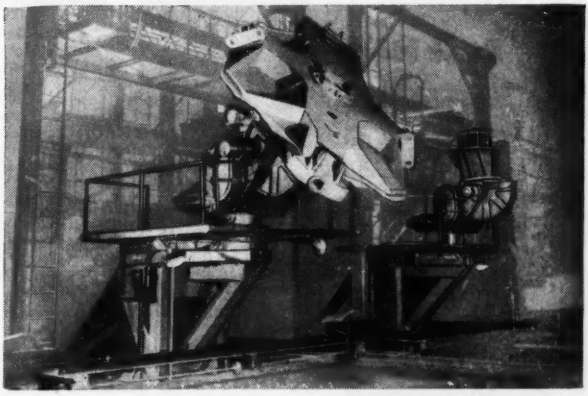
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Dayton Rogers Countersink Gage

as to size and shape for grinding and sharpening, as well as finished countersunk screw adapters. Five different countersink angles are provided on the gage, including two gage view profiles in each instance.

The Dayton Rogers Countersink Gage, which can be used as a standard for grinding machine countersinks as well as for checking the finished work, is offered free to mechanical executives addressing requests on their company letterheads.

Correction

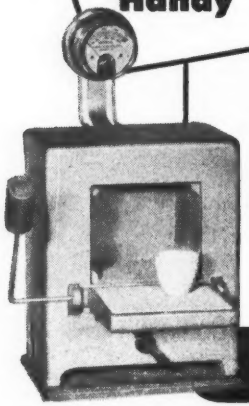
In describing the Yankee "Handi-Blox" on page 264 of the May, 1945, issue of MODERN MACHINE SHOP, the statement was made that these blocks are said to be accurate within 0.001 inch. This should have read: "Said to be accurate within 0.0001 inch."

Books

Practical Design for Arc Welding, Vol. II. By Robert E. Kinkead. Published by The Hobart Bros. Co., Troy 1, Ohio. 3¾ x 11½-inch pages. Cloth binding, board covers. Price, $3.50.

Taking up where the first volume left

***Uniform Temperature**
Fast Heating
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Handy



● The heating element in the Temco furnace operates with unusual speed. A working temperature of 1500° F. is attained in only 30 minutes and intermittent peak loads of 1850° F. are within the practical range of this rugged, long life furnace. A four point switch provides temperature control in four ranges and adjustable rheostat bands allow close heat selection within any range. The accurate, dependable pyrometer is calibrated to 2000° F. and 1100° C. in 50° increments.

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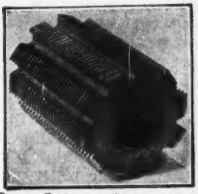
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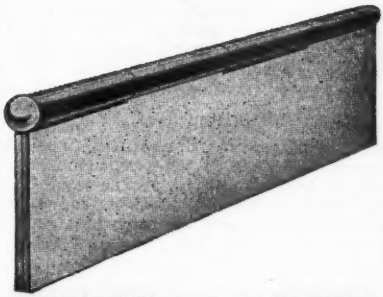


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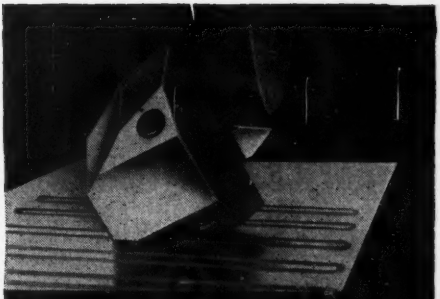
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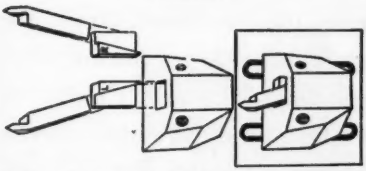


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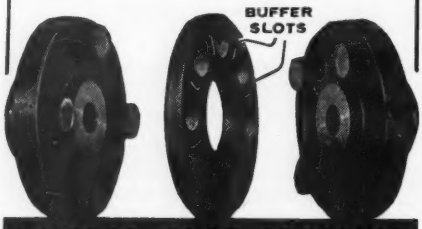
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In selecting the 100 design ideas for this second book, the author has paid considerable attention to the fabrication of tubular members and connections. Many of these ideas will be found applicable both to piping installations and to tubular structural design.

Individuals not having access to Vol. I can still obtain a copy from the company at a price of $3.50.

Plastics—Scientific and Technological. By H. Ronald Fleck. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 352 pages. Illustrated. Cloth binding, board covers. Price, $6.50.

This up-to-date and comprehensive book covers the scientific and technological aspects of the ever-growing plastics industry. It comprises a critical survey of the literature and a correlation of scattered data which should be of value both to chemists of the plastics industry and to the practical men whose work requires the knowledge of the chemistry and technology of plastics. The book is also particularly suited as a text for college courses on plastics. The description of reactions and details of procedure, complete to the last proportion and temperature, should be found useful in conducting plastic research both in colleges and industrial laboratories.

The newest developments in plastic materials both in the United States and in Europe are discussed in great detail. The book is replete with useful tables, diagrams, and data of interest primarily to technicians, chemists, professional men, and students who are seeking more than an elementary text on the subject.

"Improvement of Labor-Utilization Procedures" is the title of a 44-page bulletin now available through the Superintendent of Documments, U. S. Government Printing Office, Washington 25, D. C. Written from the standpoint of plant management, the bulletin should be of value to employers who are in search of improved labor-utilization procedures. Copies of Bulletin No. 807 can be obtained at a price of 10 cents each.

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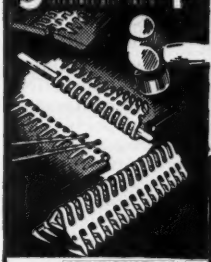
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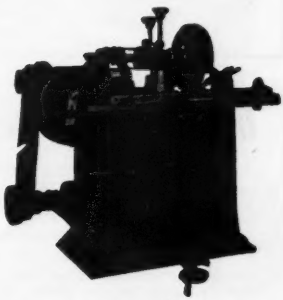
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Savings in cutting hours and greatly reduced blade replacements will enable this machine to return its investment in a short time.

It's fully automatic, grinding from 30 to 75 teeth per minute. This is the only combination circular band and hack saw grinder made that does not depend on the shape of the grinding wheel edge to shape the cutting edge of the tooth. Available in bench and floor models. Bulletin on request.

ALL PURPOSE: Sharpens a wide range of sizes in circular, hack and band saws as small as 32 teeth to the inch, for metal and woodworking purposes.

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3166 Fulton Rd., CLEVELAND 9, OHIO

Export Shippers Guide. A 1945 edition of Scehdule B, "Statistical Classification of Domestic and Foreign Commodities Exported from the United States, Part I," has been released by the Bureau of Census, Department of Commerce, through the Government Printing Office. The publication presents an alphabetical listing of commodities and commodity numbers used in reporting exports.

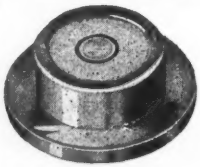
Foreign trade statistical regulations of the Department of Commerce require that the correct Schedule B commodity number be reported on all shipper's export declarations. Exporters will find the new edition of Schedule B an indispensable guide for this purpose.

Schedule B—Part I may be purchased at the office of local Collectors of Customs or from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for $1.00.

"How You Can Get a Better Job." By Willard K. Lasher and Edward A. Richards. Published by American Technical Society, Drexel Avenue at 58th St., Chicago 37, Ill. 216 pages. Cloth binding, board covers. Price, $1.50.

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This book is written especially for men and women who are seeking employment or who are ambitious to qualify for a better job by earning promotion. It is filled with practical down-to-earth ideas that the two authors have used and developed during their many years on the "hiring line." These ideas and facts cover the application of certain fundamental principles of thinking and acting which are said to determine to a large extent each person's measure of success in life.

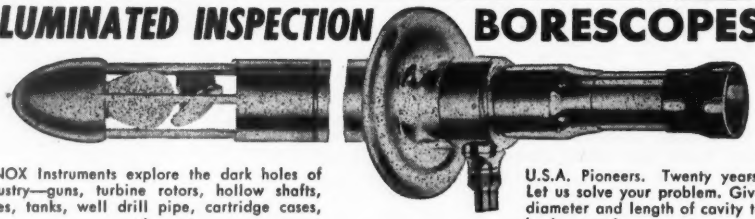
The book is divided into four principal parts as follows: The Human Element; Self-Management; Selling Yourself; and Getting Ahead. Drawings are used throughout to enhance the interest of the text.

Cast Metals Handbook, Third Revision, 1944. Published by American Foundrymen's Association, 222 W. Adams St., Chicago 6, Ill. Cloth bound, 745 pages. 258 illustrations. 204 tables. Price, $6.00.

The 1944 edition of the A. F. A. "Cast Metals Handbook" represents a most extensive revision from the previous edition (1940). It deals exclusively with the engineering properties of cast metals and has been prepared especially for use by those who design metal parts and who specify or purchase cast metals for industrial products.

The book includes considerable information of value to designers of castings, showing numerous examples of specific structure where redesigning has made possible a greatly improved cast product. Included are recommendations to buyers of castings that should solve many problems of the manufacturing purchasing agent. A section also is devoted to the significance of strength and ductility tests of metals,

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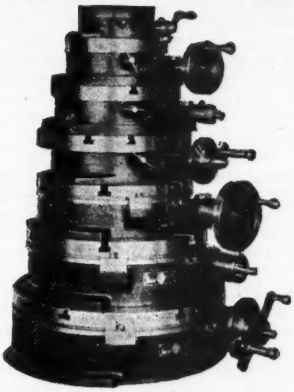
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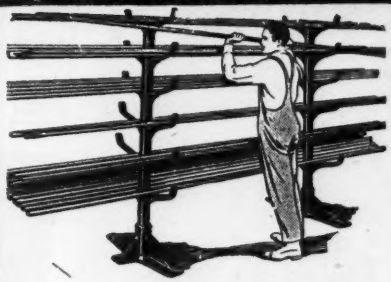
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covering such tests as resistance to fracture, creep strength, hardness, static and dynamic ductility, corrosion fatigue, wear, and so on.

Separate and extensive sections deal with steel, Malleable Iron, Cast Iron, and the Non-ferrous Alloys, all technical data included having been brought up to date in the light of cast metals developments made since publication of the previous edition. The book is intended for long-range use rather than simply to cover specifications on metals. However, conforming specifications (A.S.T.M., Federal, Navy, S.A.E., A.M.S. and Bureau of Ships) are shown for both ferrous and non-ferrous products.

The technical data given were prepared and approved by committees of the American Foundrymen's Association, composed of many outstanding authorities on cast metals and foundry practices. Extensive bibliographies are included for each of the various cast metals sections, with the many references to both American and foreign foundry practices adding to the value of the book for research purposes.

Conference Leader Training. By Edward S. Maclin and Paul S. McHenry. Published by National Foremen's Institute, Inc., Deep River, Conn. 30 pages, 5½ x 8 inches. Cloth binding, decorated covers. Price, $2.50.

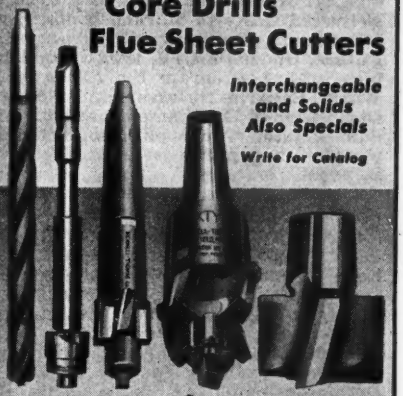
This manual endeavors to present in a concise form the needs for leadership training and to develop an interest in learning the underlying principles of conference leading through individual study and by observing an experienced leader at work. In addition, the manual presents in a practical form the various devices used in dealing with different situations, as well as the techniques involved in planning and leading a discussion.

"Conference Leader Training" is divided into nine chapters having the following headings: How to Use This Manual; The Conference As a Method of Instruction; The Conference Leader and His Job; Devices Used by Conference Leader; Training Conference Leaders; The Introductory Conference; Preparing Conference Outline; Practice Conferences; and Setting Up a Conference In Your Own Plant or Department. An appendix which contains a suggested list of topics for conference discussion is included together with a special bibliography.

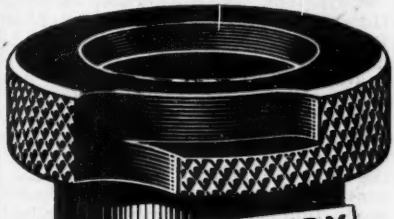
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Aluminum. By Nathanael H. Engle, Homer E. Gregory and Robert Mosse. Published by Richard D. Irwin, Inc., 332 S. Michigan Ave., Chicago 4, Ill. 480 pages, 6 x 9 inches. Cloth binding, board covers. Illustrated. Price, $6.00.

This volume provides an intensive and vital study of the effects of war upon a basic industry, with special emphasis on the postwar outlook for aluminum. It contains a detailed analysis of aluminum production costs and covers the industry completely from raw materials to postwar markets. It answers hundreds of questions now upper most in the minds of those who are interested in the future of light metals.

The book is divided into four main parts, Part I being entitled "Factors of Aluminum Production." Parts II, III, and IV are headed "The Aluminum Industrial Structure," "Aluminum Markets," and "Recommendations for Public Policy" respectively. Under Part I are the following subheadings: World Bauxite Resources; Clay and Other Raw Materials, Electric Energy; Labor; and Capital and Management.

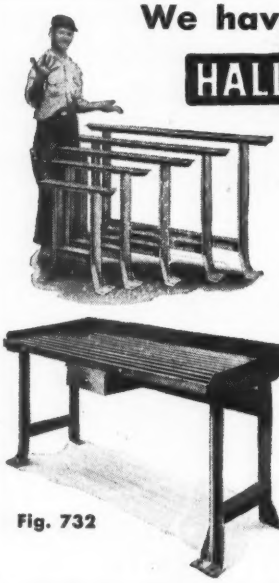
Part II has the following subheadings: Economics of Bauxite and Alumina Production; The Aluminum Reduction Industry; Fabrication and Finished Products; Costs of Production; and Regional Costs of Production and Distribution. Part III is sub-divided as follows: Markets—Past and Prospective; The Transportation Market for Aluminum; The Industrial Market for Aluminum; The Industrial Market for Aluminum (cont'd); Delivered Costs to Market Centers; and Magnesium, Competitive Threat of the Future. Under Part IV, the two subheadings are: A Program for Allocation of World Bauxite Reserves and Proposed Disposition of Government-owned Aluminum Plants. The book also includes a complete appendix.

Care and Use of Hand Tools. By Raymond R. Toliver. Edited by William C. Lewis. Published by John Wiley & Sons., Inc., 440 Fourth Ave., New York 16, N. Y. 93 pages. 70 illustrations. Cloth binding, board covers. Price, $1.25.

Much of the material in this book was prepared originally for the training of beginning employees in a large B-29 Superfortress airplane plant. The entire book has been re-written in more general form in order to make it equally

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useful for both pre-production industrial training classes and shop classes in high schools and manual training institutions.

Since "The Care and Use of Hand Tools" is an elementary manual describing and illustrating the handling of common tools used in machine shops, it is suitable for beginning mechanics who will work in small shops as well as in large plants and suitable for peacetime training as well as wartime industrial classes.

The book is divided into 14 lessons covering the following subjects: Vises; Hammers; Cold Chisels; Files, Screwdrivers; Hacksaws; Pliers and Nippers; Wrenches; Torque Wrenches; Machine Screw Taps; Drilling; General Reaming Practices; Measuring Tools; and Micrometers. The book also includes a demonstration and discussion guide.

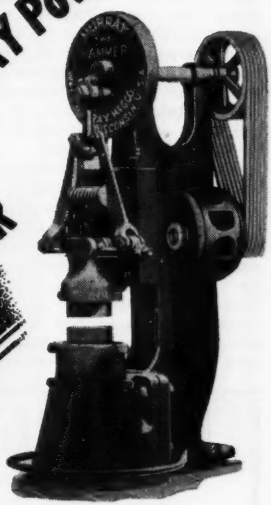
Job Safety Training Manual By Kenneth L. Faist and Stanton M. Newkirk. Published by National Foremen's Institute, Inc., Deep River, Conn. Loose-leaf pages, 6½x9 inches. Steel ring binding, blue fabrikoid cover. Seventy instruction sheets with four supplements "Way to Safety" card; "Safety for You." (36-page two-color booklet); "Carelessness Cripples" (8-page booklet); Opportunities for Promotion Through Job Safety Training" (20-page manual for supervisors). Complete price, $5.00 plus postage.

This manual provides a brief, intensive training program for foremen and supervisors which is composed of five two-hour sessions. Simple and basic, the manual covers a practical technique for the prevention of accidents that is applicable to every type of job.

The manual is especially organized to serve as a working tool in conducting JST (Job Safety Training) sessions. It provides the conference leader with the information he needs to carry out a plantwise safety training program. It also contains a plan for continued post-session safety instruction. Supplementary materials for job safety education are carefully linked with the program.

All training sessions are based on actual cases provided by participating members. Supplements included with the manual are used at specific points in the training sessions to deepen, enlarge, and fix as a part of his job safety pattern the technique of safety the participant has himself demonstrated visually, orally, and manually during his JST instruction.

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How to Handle Labor Grievances. By John A. Lapp. Published by National Foremen's Institute, Inc. Deep River, Conn. 293 pages. Cloth binding, board covers. Price, $4.00.

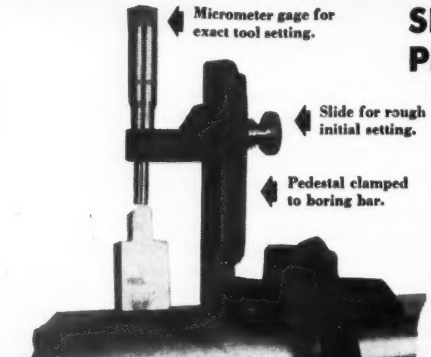
This book is the outcome of the experience of the author in handling arbitrations of labor grievances and in formulating and interpreting collective bargaining contracts. This experience has been reinforced by observation of the work of many grievance committees, by consultation with scores of labor and industry leaders, by a study of a large number of collective agreements and by a review of the printed materials on the history of collective bargaining. The history of the development of grievance plans, the operation of grievance systems, and the problems which have resulted make up the subject matter of the book.

"How to Handle Labor Grievances" is divided into five principal parts which are headed as follows: Background and History of Grievance Procedures; Grievances and How to Deal with Them; Outline of Grievance Procedures; Arbitration of Grievances; Grievance Procedures in Selected Industries; and Problems of Grievance Procedures. Each part is in turn divided into two or more chapters. The book also contains an appendix which comprises 25 chapters.

Fundamental Business Law. By Jay F. Christ. Published by American Technical Society, Drexel Avenue at 58th St., Chicago 37, Ill. 332 pages. Illustrated. Cloth binding, board covers. Price, $3.00.

Written by a man with years of "on-the-job" and teaching experience, this book provides a summary of the most important and most frequently encountered principles of the law in relation to common business transactions. In addition to the fact that the illustrative problems are practical ones as far as it has been possible to make them so, an effort has been made to make the book useful in another way. The book contains more than statements about what the law is; it contains many instances in which the law is uncertain or in which it varies in different states, or where, for one reason or another, the services of an expert are required. The cases in which one should consult legal counsel

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are indicated in the book, which is thoroughly indexed for quick and accurate reference work and includes numerous questions and answers for each chapter.

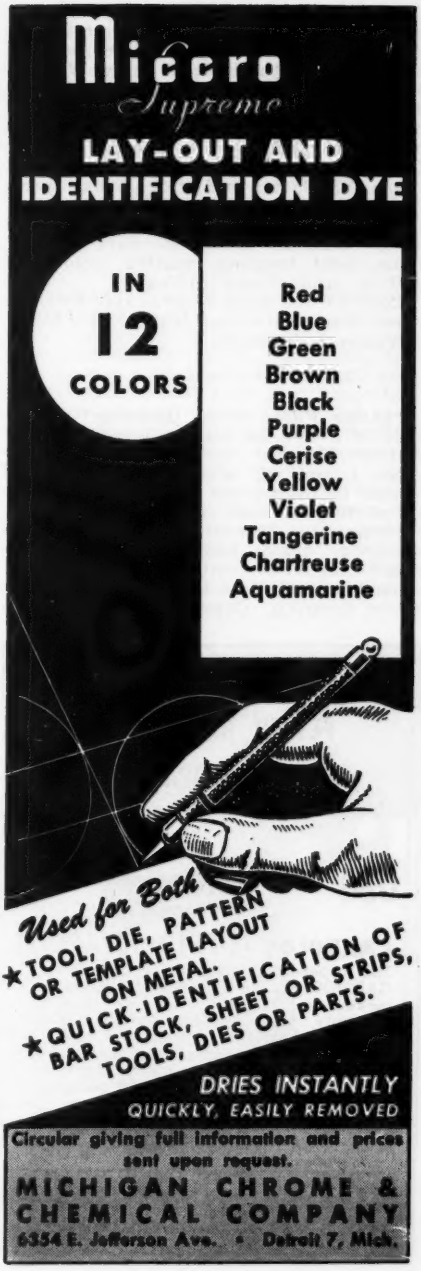
The 13 chapters comprising the book are headed as follows: The Formation of Contracts; Unenforcible Agreements of Competent Parties; Contractual Obligations; Contracts for the Sale of Goods; The Law of Agent and Principal; Law of Partnerships and Corporations; Law of Personal Property; The Law of Negotiable Instruments; Real Property Law; Law of Insurance; Employers' Liability for Injuries to Employes; Interpretation of Contracts; and Counterfeit Money.

"G. I's Opportunity," a 64-page guide book for those desiring to own their own business has been issued by Adventures in Business, 112 West Main St., Los Angeles 15, Calif. The book contains 34 authentic case histories of 34 successful concerns, including the men, ideas, and methods that made them great. Copies of the book are available at a price of 25 cents each.

Shop Literature

"All Machine Shops Need Diamonds" is the title of a four-page folder now being distributed by Somerset Industrial Diamond Co., 220 Virginia St. Hillside, N. J., presenting illustrations together with price and other information concerning diamond dust, chisel point diamonds, and various types of diamond dressing tools. Copy free upon request.

Colonial "Junior" Hydraulic Presses. A four-page bulletin describing its expanded line of improved "Junior" Hydraulic Presses intended primarily for light and medium duty assembly and broaching work is now being issued by the Colonial Broach Co., P. O. Box 37, Harper Station, Detroit 13, Mich. The bulletin includes complete specifications, descriptions, and photographs of both the bench hand base types of Junior presses, each of which is available in 1, 2, and 4-ton sizes. Copy of Bulletin VJ1-44 free upon request.



"Focus on Federal Screws," a 24-page pictorial book of particular interest to designers and production men, is announced by the Federal Screw Works, 3401 Martin Ave., Detroit 10, Mich. The book shows the facilities of the company for the contract manufacture of screw machine products and cold-forged parts to customers' specifications. The latter half of the book clearly illustrates and describes numerous typical parts produced, involving all screw machine and secondary operations, heat treating, plating, cold upsetting, and thread rolling.

Copy of the book is available free to executives addressing requests on their company letterheads.

"Inside Facts About Dressing" is the title of a 16-page booklet issued by the Perfex Dresser Corp., 3601 Gaylord Ave., Detroit 12, Mich., the purpose of which is to provide the reader in an interesting manner vital "know how" information regarding plain radius dressing, plain angle dressing, and angle-tangent-to-radius dressing. Included is a total of 47 practical tips on wheel dressing. Copy of booklet free.

Holden Flow Heat Treatment, a process involving bright hardening, quenching, and tempering, is covered in a four-page bulletin which indicates the steps, baths, temperatures, times, and equipment used for flow heat treatment. It also includes technical information as to the physical properties obtainable through lamp located within the tank, opposite the spindle.

Ransome Welding and Assembly Positioning Equipment. Bulletin No. 254 presenting in concise form information on the full line of Ransome welding and assembly positioning equipment has been prepared by the Ransome Machinery Co., Dunellen, N. J. Copy free upon request.

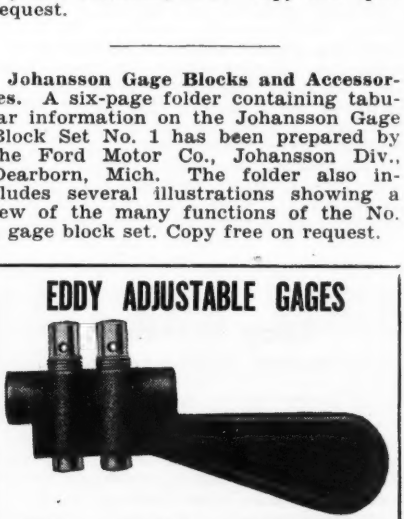
Johansson Gage Blocks and Accessories. A six-page folder containing tabular information on the Johansson Gage Block Set No. 1 has been prepared by the Ford Motor Co., Johansson Div., Dearborn, Mich. The folder also includes several illustrations showing a few of the many functions of the No. 1 gage block set. Copy free on request.

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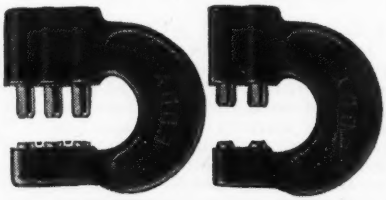


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"Setting Up and Operating a Welding Business" is the title of a 100-page pamphlet published by The James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio. The pamphlet is said to contain many helpful suggestions for the individual contemplating the establishment and operation of a welding business. It is further believed that much of the material will be of interest and help to anyone now operating a welding business.

The material comprising the pamphlet consists of three award-winning studies from Foundation award programs. Particulars of the contents are as follows:

"Developing and Conducting a Commercial Welding or Job Shop," by Fred H. Drewers, Welding Engineer, W. P. Thurston Co., Engineers and Contractors, Richmond, Va. Paper submitted in 1940-42 Industrial Progress Award Program and reprinted from "Studies in Arc Welding Design Manufacture and Construction," a 1295-page volume containing 98 award-winning studies.

"How to Use the Arc to Increase Business in the Garage," by E. W. Weinberger, Owner, Weinberger's Garage, Mott. N. D. Paper submitted in 1937-38 Industrial Award Program and reprinted from "Arc Welding in Design Manufacture and Construction," a 1409-page volume containing 108 award-winning studies.

"Organization of Garage or Service Station is Arc Welded," by Clarence McClellan, Director of Welding, McClellan and Sons Super Service Station, Menomonie, Wis. Paper submitted in 1940-42 Industrial Progress Award Program and reprinted from "Studies in Arc Welding Design Manufacture and Construction."

"Hydraulic Circuit for Industrial Equipment" is the title of a 28-page booklet prepared by the John S. Barnes Corp., 301 S. Water St., Rockford, Ill. The booklet explains how standard and special Barnes elements are integrated into compact unit type circuits and how these custom-built circuits have improved machine performance and substantially increased output. Profusely illustrated, the booklet describes the application of Barnes hydraulic circuits to such machines as lathes, riveters, grinders, and other machine tools and industrial equipment. Copy is available free upon receipt of a request addressed on a company letterhead.

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FEATURES

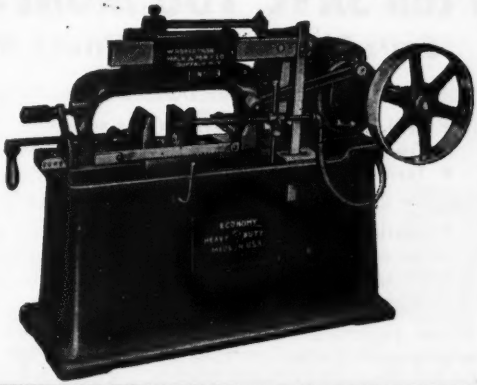
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Bowser Storage and Dispensing Equipmment for lubricating oils, paint oil, varnishes, gasoline and other liquids is fully illustrated and described in a twelve-page catalog released by Bowser, Inc., Fort Wayne 5, Ind. Copy free upon request.

"Springs Designed for the Job Improve Product Performance." To emphasize the importance of correct spring design, the Muehlhausen Spring Corp., 201 Michigan Ave., Logansport, Ind., has published an eight-page two-color booklet discussing the four factors essential to designing a spring for an application. The five basic types of springs are illustrated and defined, and a wide variety of the many shapes and sizes into which these five types may be designed is shown. Covered in detail are 12 of the commonly used spring materials, with descriptions of their characteristics. The specialized equipment that is necessary to efficiently produce the multitudinous variety of spring designs is also shown in the booklet, copy of which is available free upon request.

Tamaloy Carbide Tools. An eight-page catalog issued by the Tungsten Alloy Manufacturing Co., 65 Golden St., Newark 4, N. J., presents illustrations, diagrams, and specifications of Tamaloy carbide-tipped cutting tools, tool blanks, and lathe and grinding centers. Arranged for ready reference, the catalog contains brief descriptions of the characteristics of the various grades in which Tamaloy is supplied, together with suggestions as to their appropriate applications. A group picture of various special Tamaloy-tipped tools, dies, and accessories is also included. Copy of Catalog T44 free.

Master Copy Type, the name given to the templates or patterns manufactured by the George Gorton Machine Co., 1709 Racine St., Racine Wis., is described in complete detail in a 24-page catalog issued by this firm. Samples and tables showing all styles and forms of Master Copy Type are included in the catalog, together with illustrations and descriptive information on master copy dials for indexed engraving and special templates for profiling. Copy of Catalog 1309-B free upon request.

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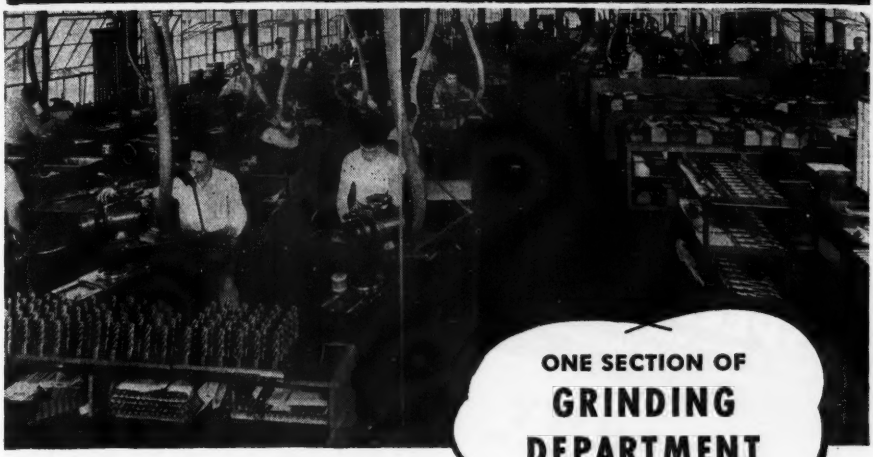
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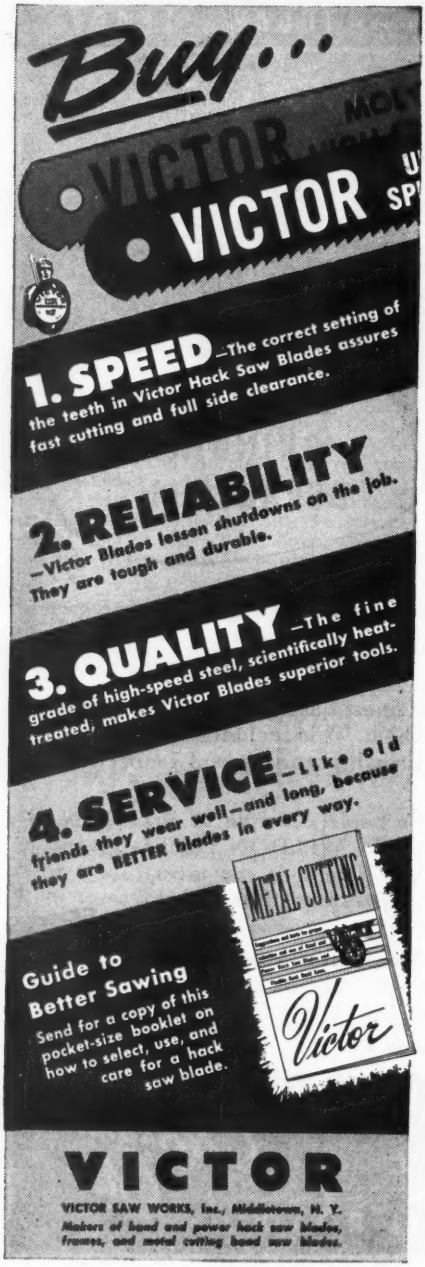
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THE WELDON TOOL CO. Cleveland 4, Ohio



3000 WOODHILL ROAD



Dustkop Dust Collectors. A 24-page bulletin of individual type self-contained dust collectors for collecting dust from all sizes of surface, tool, pedestal, and disc grinders and sanders is now being distributed by the Aget-Detroit Co., 604 First National Bldg., Ann Arbor, Mich. Feature of the bulletin is the indexing which is according to grinder sizes rather than by dust collectors, and which permits rapid selection of the correct dust collecting equipment for any type of dust source.

Dimensions of the dust collecting units are provided in sketches as well as in specification tables in each section. Accessories required for the installation, together with the prices, of the complete dust collecting units are listed at the front of each section. Copy of Bulletin A-200 free upon request.

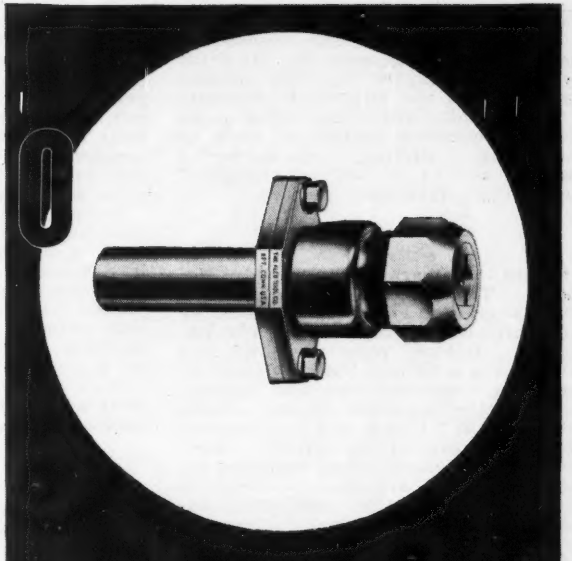
Woodworth Precision Gages. The N. A. Woodworth Co., 1300 E. Nine Mile Rd., Detroit 20, Mich., has prepared an 84-page Wire-O bound catalog containing illustrations, descriptions, and tables concerning the complete line of gages manufactured by this firm. Featured in the catalog are three special Woodworth products; namely (1) the Limitrol gage which peforms six visual inspection operations in one, (2) Carboloy gages with exclusive segmented shanks, and (3) gages of cast Stellite alloy.

In addition, the catalog covers precision thread plug and thread ring gages, cylindrical plug and plain ring gages, profile and contour gages, fixed snap gages, special built-up and flush pin gages, and a comparator type roll thread snap gage. Copy of Catalog No. 44-G is available free to executives addressing requests on their company letterheads.

Wales Type "CD" Hole Punching System for use in punching holes up to 1½ inches in diameter in materials up to ⅛ inch thick are treated in a 30-page colorful catalog published by the Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. The two methods of mounting Type CD units onto a multiple hole punching die are fully described and illustrated, together with many applications of these units in press brakes and stamping presses. Copy of Catalog CD free to executives upon request.

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The Scientific Hand screw machines out first results has set one thought in mind — to produce perfect work with the minimum amount of effort.

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Please write for new complete Catalog No. 6.

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DETROIT OFFICE: 908 STEPHENSON BLDG., PHONE MADISON 5870
CHICAGO OFFICE: 608 S. DEARBORN ST., TELEPHONE WEBSTER 2868

Madco Drill Press Turret Attachment is the subject of a circular released by the Machine Development Co., 516 Fifth Ave., New York, N. Y. The circular describes how the attachment converts a single spindle drill press for multiple spindle production operations, such as spot-facing, drilling, counterboring reaming, and so on, without change of tools. Copy free upon request.

Gorton Pantograph Engraving Machines. The complete line of Pantograph engraving machines marketed by the George Gorton Machine Co., 1709 Racine St., Racine, Wis., is shown and described in a 20-page bulletin issued by this firm. Specifications and applications of the standard Gorton models designated as 3-U, 3-Z, and 3-L comprise the greater part of the bulletin. However, descriptions of seven machines for special purposes are also included. In addition, cutter depth regulators, adjustable forming guides, enlarging spindles, and other attachments for Pantograph machines are illustrated and their applications listed. Copy of Bulletin 1580-B free upon request.

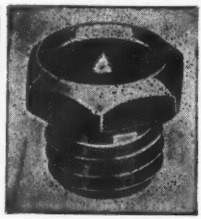
Aircraft Tools Catalog. Aircraft Tools, Inc., 750 E. Gage Ave., Los Angeles 1. Calif., has published a 178-page reference manual, containing photographs, blueprint drawings, and full construction details of small hand tools for aircraft production and maintenance. The manual is clearly written and indexed, and presents convenient price and ordering information.

Included are sections on riveting tools, dimpling tools, angle drills, cutting tools, and bucking bars. One section is devoted to miscellanous tools, such as strap duplicators, rivet squeezers, pliers, cable splicers, torque wrenches. chip chasers, and other precision-made products. Useful engineering data may be found in the 9-page appendix.

Copy of manual is available to executives addressing their requests on their company letterheads.

Udylite Handiplater, a complete portable, small size plating unit which is said to be ideal for plating odd lots of small parts, is illustrated and described in a bulletin issued by The Udylite Corp., 1051 E. Grand Blvd., Detroit 11, Mich. Copy free upon request.

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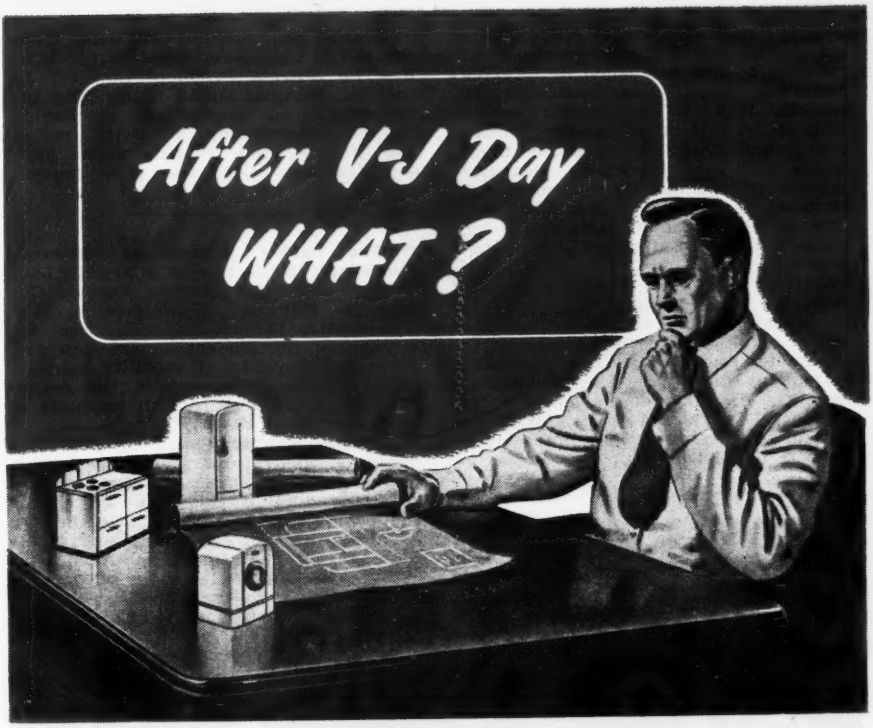
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"The Use and Care of Micrometers" is the title of a 24-page profusely illustrated booklet published by Sav-Way Industries, Box 117, Harper Station, Detroit 13, Mich. This colorful booklet, designed to introduce Sav-Way master setting and checking rolls for micrometers and other precision measuring instruments, completely "dissects" the micrometer, explains in detail the functions of the various parts, tells how to use the micrometer and how to take proper care of it.

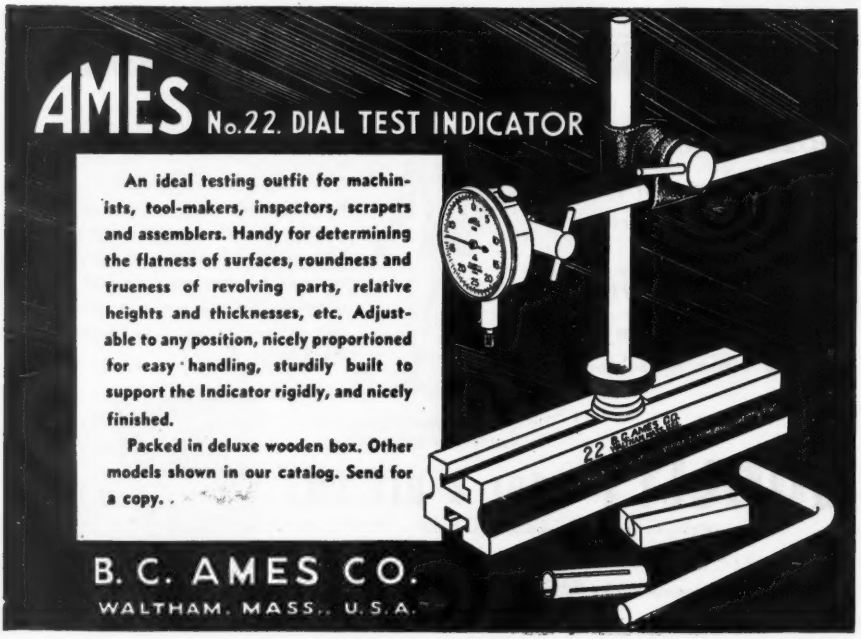
Written in simple, easily understood language and adequately illustrated with photographs and drawings, the booklet explains the operation of the micrometer and stresses the importance of frequent checking to ensure accurate readings. Also included is a helpful "do and don't" list aimed at prolonging the life and serviceability of the micrometer. Copy of booklet free upon request.

Zagar Hydraulic Broaching Machine for small parts is the subject of an illustrated mailing piece now available free from Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.

"Slash Time and Cost with Roto-Finish" is the title of a folder published by The Sturgis Products Co., 283 Jacob St., Sturgis, Mich., illustrating and describing an improved mechanical process for grinding, deburring, polishing, honing, and coloring metal parts and castings. Copy free upon request.

"The Turner System of Materials Handling" is the title of a 20-page book published by the Factory Service Co., 4615 N. 21st St., Milwaukee 9, Wis. The system is based upon vertical extension of the perfect square and provides the benefits of mobility, orderliness, and co-ordination in the manufacture of large and small products or parts in every description.

Practically every page of the book contains illustrations and ideas for organizing plant interiors for modern mass production and the systematic movement of products or parts through the plant. Interchangeable and interlocking units of almost unlimited flexibility are described. Copy of book is available free to executives addressing requests on their company letterheads.



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"Proven Plans for Improving and Rectifying Most of the Obstacles to Good Industrial Relations and Bringing Management and Labor Closer Together" is the title of a 9½ x 11⅝-inch file folder prepared by the Incentive Engineering Division of Royal Incentives, 41 John St., New York, N. Y. A complete file covering the subject of coordinated incentive merit award system is included in the folder, together with other interesting and helpful information. Copy of folder is available free to individuals addressing requests on their company letterheads.

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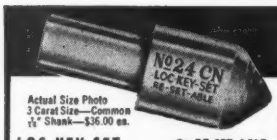
Oilite Book. A 168-page book on the subject of powder metallurgy is now being distributed by Chrysler Corp., Amplex Division, 6501 Harper Ave., Detroit 31, Mich. The book is designed to provide American industry with a complete knowledge of the wide variety of powder metal bearings and parts now being produced by Chrysler under the Corporation's Oilite trade name.

The book contains many up-to-the-minute engineering developments and general facts concerning the greatly expanded art of producing bearings and machine parts from metal powders. In addition to providing listings of more than 13,000 available sizes of self-lubricating plain, flange, and thrust bearings made from Oilite bronze, Super-Oilite (ferrous base), and iron Oilite. the book provides a newly expanded list of Oilite cored and bar stock sizes.

A 23-page engineering section included in the book covers such subjects as specifications; design features and practices; shaft clearance; load rating charts; recommended methods of sizing; tolerance data; drawings and tables on chamfers and fillets; easy machining methods, and a treatise on lubrication.

The book also contains illustrations and information on such products as the new Oilite Giants—huge, self-lubricating bearings up to 20 inches in diameter—Oilite bronze, Super-Oilite, Super-Oilite "16," and iron Oilite bearings; Oilite cored and bar stock; Oilite filters; and the newly-developed, light, strong aluminum Oilite bearings. Of special interest are the illustrations and text on Oilite, Stressite, and Damascite machine parts now being made by Chrysler Corporation.

Copy of book is available free to executives addressing requests on their company letterheads.



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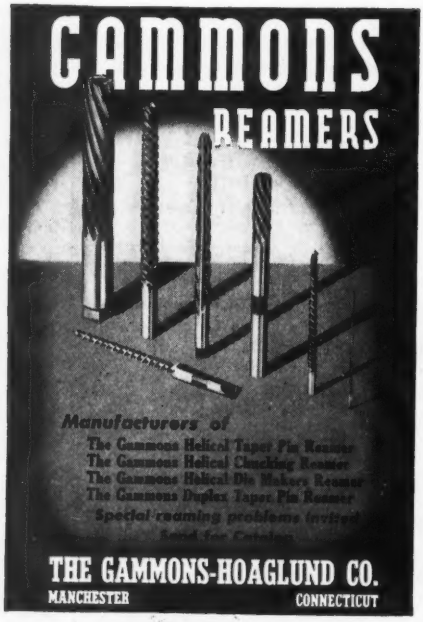
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STARRETT HACKSAWS

Clark Adjustable Cutters. The Robert H. Clark Co., Dept. MMS-11, 9330 Santa Monica Blvd., Beverly Hills, Calif., announces the release of a 12-page catalog on adjustable cutting tools. Printed in two colors and profusely illustrated with diagrams and photographs of actual operations, the catalog contains complete specifications and prices as well as detailed descriptions of the entire line of Clark adjustable cutting tools. A feature of the catalog is the handy index and ready reference arrangement which has been worked into the cover design. Copy of Catalog No. 44 free upon request.

Ames Dial Indicator and Comparator Catalog No. 53. A 56-page catalog covering all Ames impersonal measuring instruments has been prepared by the B. C. Ames Co., Waltham, Mass. Conveniently arranged for ready reference, the catalog treats of dial indicators, micrometers, comparators, cylinder gages, and thickness measures, and includes approved dimension data of the American Gage Design Committee. Copy of Catalog No. 53 free to executives upon request.



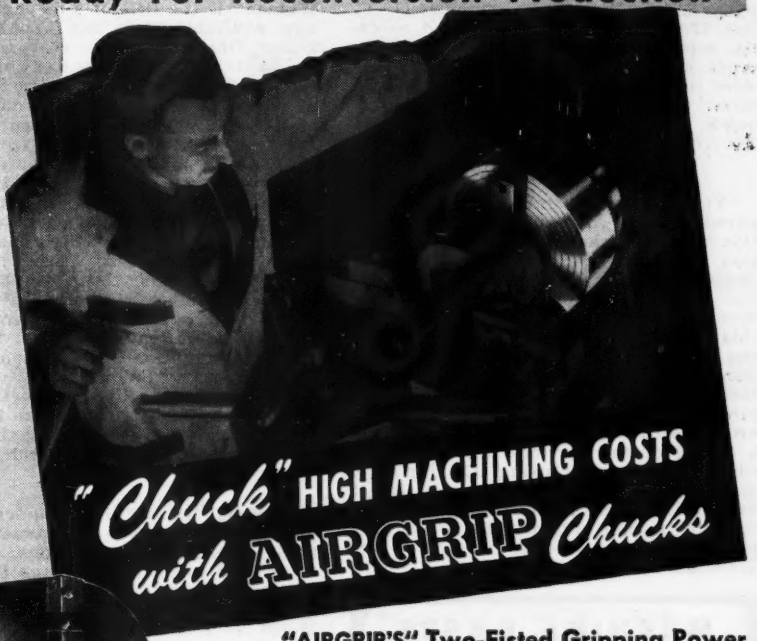
Alloy Arc Welding Electrodes. Alloy Rods Co., York, Pa., has issued a 24-page catalog containing tool steel welding data, general instructions for the use of Arcaloy tool steel welding electrodes, illustrations of typical tool steel welds, and complete information on Arcaloy high speed, hot work, air hardening, work hardening, oil hardening, and water hardening tool steel welding electrodes. A hardness conversion table as well as a table on the classification of tool steels is included in the catalog, copy of which is available to executives free upon request.

Profilometer Technical Booklet. The technical aspects of the Profilometer as an electronic measuring instrument are discussed in a 12-page booklet issued by Physicists Research Co., Dept. 6, Ann Abor, Mich. Although devoted mainly to the development and technical side of the Profilometer, the booklet also describes the entire line of equipment. Illustrations are provided throughout the booklet which is punched to fit a standard three-ring folder or the Profilometer Comments binder furnished by the company. Copy of booklet free upon request.

South Bend Lathe Catalog 100-D. All sizes and types of South Bend Engine Lathes, Toolroom Lathes, and Precision Turret Lathes are clearly illustrated in color and described in a 64-page 11 x 8½-inch catalog published by the South Bend Lathe Works, South Bend 22, Ind. Complete specifications, including capacities, speeds, feeds, and weights, are printed opposite the illustration of each lathe. All construction features, accessories, and attachments are also shown. Copy of Catalog 100-D free to executives upon request.



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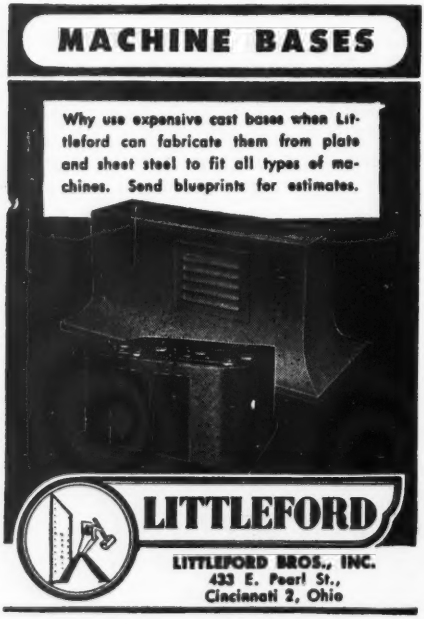
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When buying new lathes, specify "AIRGRIP" Chucks and Cylinders

Westcott Chuck Catalog No. 600. Published by the Westcott Chuck Company, 717 E. Walnut St., Oneida, N. Y., this 12-page catalog presents all essential information for selecting the proper types and sizes of Westcott chucks to meet individual requirements. The material is condensed and arranged for quick reference. Copy of Catalog No. 600 free upon request.

"You and the Returning Veteran." Prepared by the Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis., in collaboration with Esther H. de Weerdt, Ph.D., executive secretary, Wisconsin Society for Mental Hygiene and Ole N. de Weerdt, Ph.D., consulting psychologist, this 40-page booklet is intended to aid the foreman by providing him with additional information and practical suggestions on how to meet such adjustment problems of returning veterans as may arise. Also contained in the booklet is a listing of the services that the Allis-Chalmers Manufacturing Company makes available to help foremen direct and assist veterans in making their return to normal civilian life as easy as possible. Copy free to interested individuals upon request.



"Employment Opportunities in Characteristic Industrial Occupations of Women" is the title of a 56-page bulletin now available from the Department of Labor, Office of the Secretary, Washington 25, D. C. Designated as the No. 201, the bulletin is the result of one of a series of inquiries made by the Women's Bureau in fulfillment of its obligation to investigate indications as to types of jobs likely to present future employment opportunities for women. It also illustrates the way in which women's work in industry during the war has extended over a varied range in occupations having great similarity to those in which women have long been employed and in which they will no doubt continue

The bulletin has been prepared as one part of the Bureau's program to outline probable conditions for women workers in the reconversion and post-war periods. It is chiefly the work of Elizabeth D. Benham of this Bureau's Research Divisions, cooperating with Mary Elizabeth Pidgeon, director of the Research Division.

Sheffield Micro-Form Grinder is completely covered as to construction, features, operation, applications, specifications, and so on in a 16-page illustrated bulletin issued by The Sheffield Corp., Dayton 1, Ohio. Copy of Bulletin No. M-120-144 free upon request.

Foundry Accessories. Bulletin No. 600 on melting furnace accessories has been released by the Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago, Ill. Its 20-pages illustrate and describe, in concise complete form, a wide range of accessories, including combustion controls, temperature controls, thermocouples, leadwire, blast gates, valves, mixers, gages, strainers, pumps, and various other items. Copy free upon request.





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News of the Industry

New Plan To Mark Value of War Service

An interesting step in employee relations has been taken by Lawrence Aeronautical Corporation. For each employee who has worked with Lawrence on war production, a large "Certificate of Service in War Work" is made up with the employee's name filled in and ready for framing.

It is the belief of the Lawrence Corporation that this certificate will go a long way to point out the value of the service given at home by those who made military goods here for use on our many war fronts.

It will be something frequently looked at by the worker and his family and friends in future years to mark his part in this war.

That this belief is well-based is clear from the good feeling of the employees themselves when they get this "Certificate of Service." When the basic employee relations are sound to start with, such a long lasting sign of this good relationship can work out well.



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A. F. Davis Welding Library Established

To serve the welding industry, including industrial designers, engineers, technicians, and others interested in research or information on the various forms of welding and their application to design, construction, manufacture or maintenance of metal products and structures, the A. F. Davis Welding Library has been established at Ohio State University, Columbus, Ohio. Ohio State is said to be the only university offering a four-year course in Welding Engineering.

The Library already includes one of the most extensive collections of literature on welding in the world. On its shelves are more than one thousand books, including volumes on Metallurgy, Designing for Welded Construction, Welding Techniques and Procedures, and Properties of Weld Metals, also standard welding handbooks, welding magazines, the original award studies of the James F. Lincoln Arc Welding Foundations, descriptions of patents relating to welding, and many other publications.

The Library is named for its donor, Mr. A. F. Davis, vice president and secretary of the Lincoln Electric Company, Cleveland, Ohio. Mr. Davis has spent over 30 years in the welding industry.

The Library invites the assistance of the industry in extending its collection. Engineers doing original research work

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9/32	12	9	3.50
19/64	12	9	3.50
5/16	12	9	3.75
21/64	12	9	3.75
11/32	12	9	3.75
23/64	12	9	3.75
3/8	12	9	4.00
25/64	12	9	4.00
13/32	12	9	4.25
27/64	12	9	4.25
7/16	12	9	4.50
29/64	12	9	4.75
15/32	12	9	4.75
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are invited to send their papers to the Library for permanent filing and for use by the industry in future years, and friends of the Library are urged to send to the librarian the patent numbers of any patents pertaining to welding, welding equipment, welded design, or welding application.

Visitors to the Library are welcome, and communications concerning its work are invited. Inquiries may be directed to Davis Welding Library, Ohio State University, Columbus 10, Ohio.

Colonial Bushings Moves

Colonial Bushings, Inc., has completed moving into new quarters at 21601 Hoover Road, Detroit, from its former location at the foot of Jos. Campau Street. The Company, at its new location will carry an expanded line of standard drill jig bushings in stock for immediate shipment. In its new location, Colonial Bushings will be produced under controlled conditions in a modern plant. Design of the plant is such as to maintain as near constant temperature conditions summer and winter as possible to insure maximum precision in the finishing of drill jig bushings.

Udylite Increases Facilities

The Udylite Corporation, of Detroit, which manufactures plating equipment and supplies, is increasing the facilities of both its Detroit plants to meet the contemplated heavy postwar demand for its products. An additional 16,000 square feet of floor space has been acquired for the East Grand Boulevard Plant and 15,000 square feet of floor space is being added to the East McNichols Road Plant.

Grinders and Fixtures Adds Two New Products

Grinders & Fixtures, Inc., has acquired from Cleveland Tool Engineering Co. all manufacturing rights to the latter company's two principal products, the Circular Relief Grinder and Universal Indexing Head.

Whereas in the past the Circular Relief Grinder and Universal Indexing Head have been largely sold by mail, George G. Auer, President of Grinders & Fixtures, announces that the new company is creating a nation-wide sales and service organization. He states that a few territories are still open for qualified representatives. The address remains unchanged at 1255 West 4th St., Cleveland 13, Ohio.

Reconversion

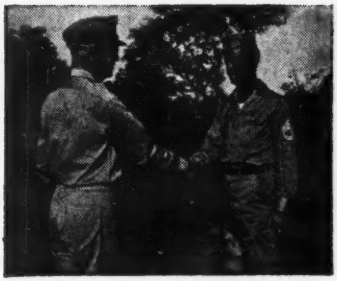
Without fanfare, the government is moving right along the reconversion road. For example, WPB has authorized auto manufacturers to spend $35,000,000 for construction work and $40,000,000 for plant rehabilitation. Airplane cutbacks are far beyond the talking stage. WPB is readying an order to permit a broad list of consumer durables manufacturers to place machine tool orders. RFC has announced a program to provide government guarantees for certain bank loans to small business.

Restrictions on the use of iron and steel to make 24 household articles, including carpet sweepers, hand clothes wringers, can openers, and garment hangers, as well as prohibition of the use of metal to make bread boxes, canister sets, carpet beaters, dust pans, fly swatters, wash boards and numerous other items for civilians, have been removed through revocation of Limitation Order L-30-d, according to the War Production Board. Production of these items now will be limited by the availability of materials, facilities, and manpower.

All special controls over the production and distribution of machine tools having a retail sales price of less than $1,000 have been removed by amendment of Equipment Order E-1-b, the machine tool distribution and production order. Hereafter, application of the order, WPB said, will be limited to machine tools listed on Exhibit A that have a retail sales price of $1,000 or over.

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Sociedad Radiotecnica Ecuatoriana, P. O. Box 414, Quito, Ecuador, would be glad to have catalogs from manufacturers of machine tools of all types who would be interested in representation in Ecuador.



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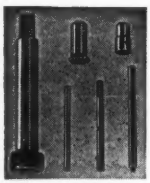
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Landis Style ALT Collapsible Tap is covered as to collapsing action, construction features, specifications, and so on, in an eight-page illustrated bulletin published by the Landis Machine Co., Waynesboro, Pa. Copy of Bulletin No. G-94 free upon request.

"Buffalo" Vent Sets are the subject of a 12-page bulletin issued by the Buffalo Forge Co., 388 Broadway, Buffalo, N. Y. The bulletin, which is designated as the No. 3499, provides physical data, dimensions, and ratings on "Limit-Load" belt-driven fans up to size 5, cast iron "Baby" vent sets, direct-connected "Limit-Load" fans up to size 4½, and "Shortboy" units in capacities up to 20,700 c.m.f. Copy free upon request.

"From the Shadoof to the Dominant Drive" is the title of a 48-page booklet compiled by the Engineering Research Committee of the Multiple V. Belt Drive Association, 140 S. Dearborn St., Chicago 3, Ill., containing an interesting outline of the history of power transmission. Copy free to executives upon request.

"Cutting Fluids for Better Machining," a 60-page handbook published by the D. A. Stuart Oil Co., 274½ S. Troy St., Chicago 23, Ill., contains extensive data on steels, machinability, hardness, tools, speeds and feeds, and allied subjects, as well as on the selection and use of cutting and grinding fluids. Typical of the articles included are "Metal-Cutting Mechanism," "Factors in the Selection of Cutting Fluids," "Precision Grinding with Oil," and "The Tool Edge Is Important." Copy of handbook free upon request.

Hevi Duty Electric Heat Treating Furnaces. Hevi Duty Electric Co., Milwaukee, Wis., has published a 40-page bulletin which illustrates and briefly describes the Hevi Duty line of electric heat treating furnaces. Furnaces treated include box furnaces, nitriding car type furnaces, rotary and roller hearth furnaces, oil bath tempering furnaces, convection furnaces, curtain type furnaces, pit and pot type furnaces, hardening furnaces, drawing furnaces, annealing furnaces, sintering furnaces, carburizing furnaces, and various other furnaces. Copy of Bulletin DH-444 free upon request.

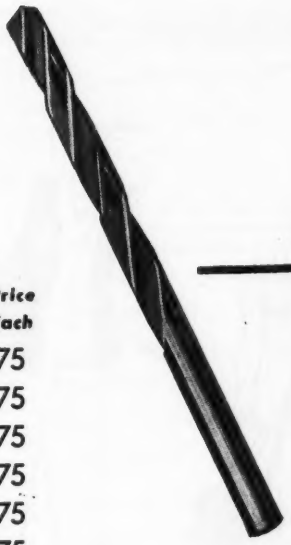
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Jones Tachometers. Bulletin No. 44-1 published by the Jones Motrola Co., Fairfield Ave., Stamford, Conn., describes four models of individual mounting type tachometers and a multi-range portable hand tachometer. The bulletin includes both full-face and profile views of the individual tachometers, as well as data on r. p. m. ranges available, mounting dimensions, prices, uses and operation, and installation. Copy free upon request.

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Over the Editor's Desk

High Wages—Reduced Costs

ACCORDING to reports, labor leaders are asking for an increase of 20 per cent in union members' pay and government officials are now trying to work out a formula to boost wages somewhere in the neighborhood of 10 per cent, all of which is designed to appease wage earners for loss of overtime pay—which is coming to an end as war contracts run out. It seems to us that a better idea would be to work out a formula for reducing living costs so that present wage and salary rates would be ample to cover the cost of living, but there is no evidence that either the labor leaders or the government officials are making any definite effort in this direction.

The disciples of one school of thought advocate high wages on the theory that a high wage level means a high level of buying power, which, in turn, is reflected in the maintenance of a high level of prosperity. These amateur economists entirely overlook the fact that when living costs rise with wages, the level of buying power is right back where it was before. No one has gained, and everyone has lost—because the value of life insurance, annuities, and other investments has suffered through the depreciation of the dollar.

Every time the workers in one group of industry are given an increased wage for a given amount of labor, the cost of living rises a little. If all of the workers in all the rest of industry received a corresponding increase, living costs would automatically increase the same amount. Obviously no one would gain an iota of advantage and all would suffer from the disadvantage which is inherent in the inflation of the national currency. And that is what it would amount to. If one group receives an advance in wages, all the other groups are entitled to the same, but it is ridiculous to assume that labor costs and prices can continue to increase forever. There must be a limit some time, and it might just as well be now.

Limiting the labor cost does not mean, however, that the worker has to go home with a smaller pay envelope; it simply means that he must begin to produce in proportion to his pay. America's standard of living is far higher than that of any other nation on Earth; higher because American engineers had the ability to design tools and because American workmen produced. But—all fanfare to the contrary notwithstanding—our production records for the past four years are nothing to be especially proud of. In many plants throughout the nation the waste of manpower and inefficiency has been a scandal among the workmen themselves, many of whom have declared to this editor that they would welcome the opportunity to do an honest day's work.

The answer lies in the application of wage incentives. A wage incentive plan, properly applied, will make it possible to maintain our present high level of wages —or even to increase them—without increasing living costs. Such a plan ensures payment to the worker for what he produces and ensures to management the labor for which it pays; it makes it possible for an efficient worker to reap the reward of his ability; it stabilizes costs; it shows up the inefficiencies in plant management and thus makes it possible to correct them.

It is to the credit of the War Production Board that the Board has fostered the use of wage incentives wherever possible, and has recently published a booklet which comprises, in effect, a report on the results that have been obtained through the use of such incentives.

Beginning with a discussion of wage incentive plans in general, the booklet outlines the type of wage incentive methods usually considered, the guiding principles for wage incentive plans, the setting of standards, and so on. Requests for copies, addressed to this office, will be honored.

Howard Campbell

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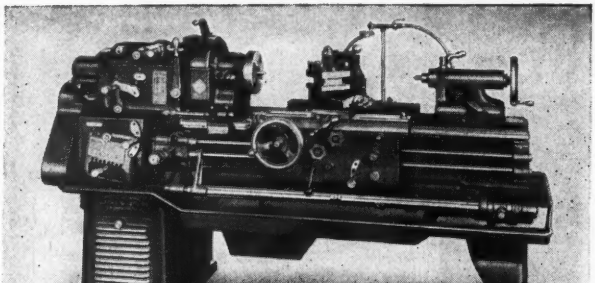
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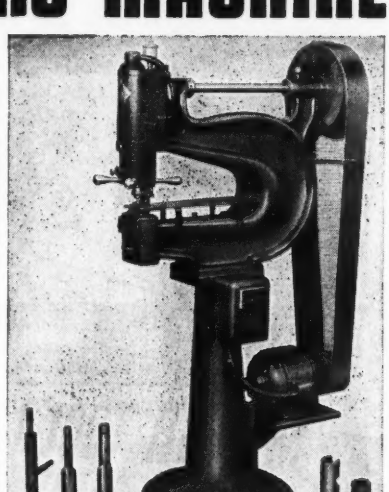
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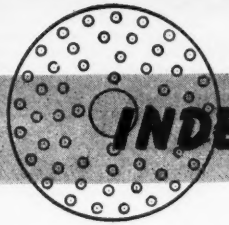
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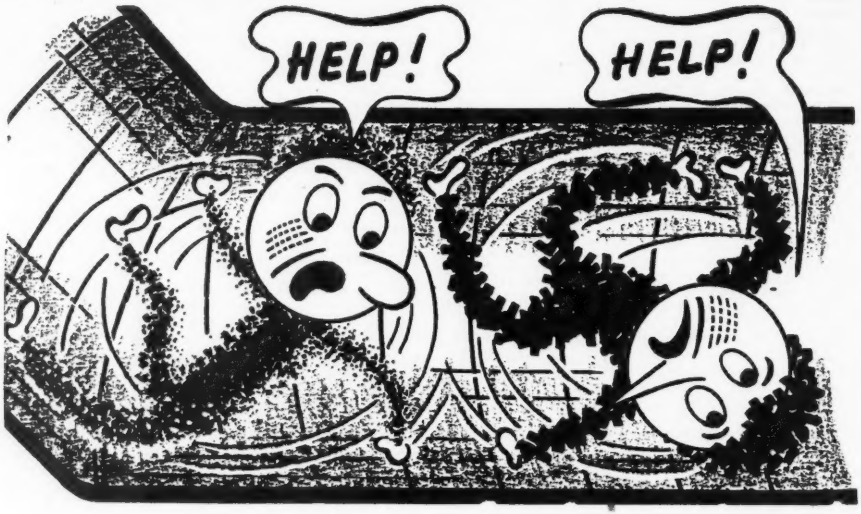
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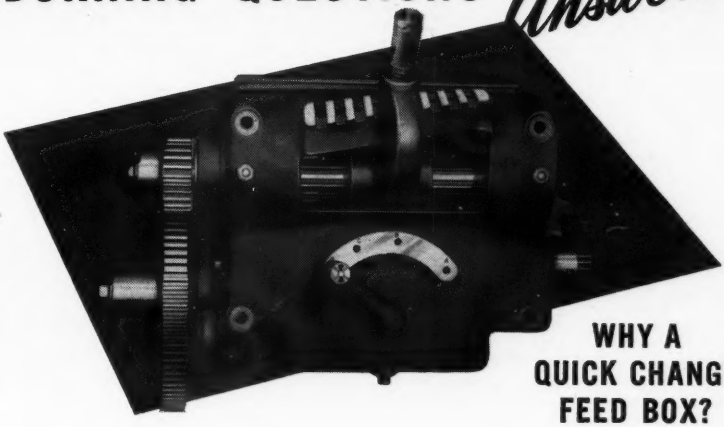
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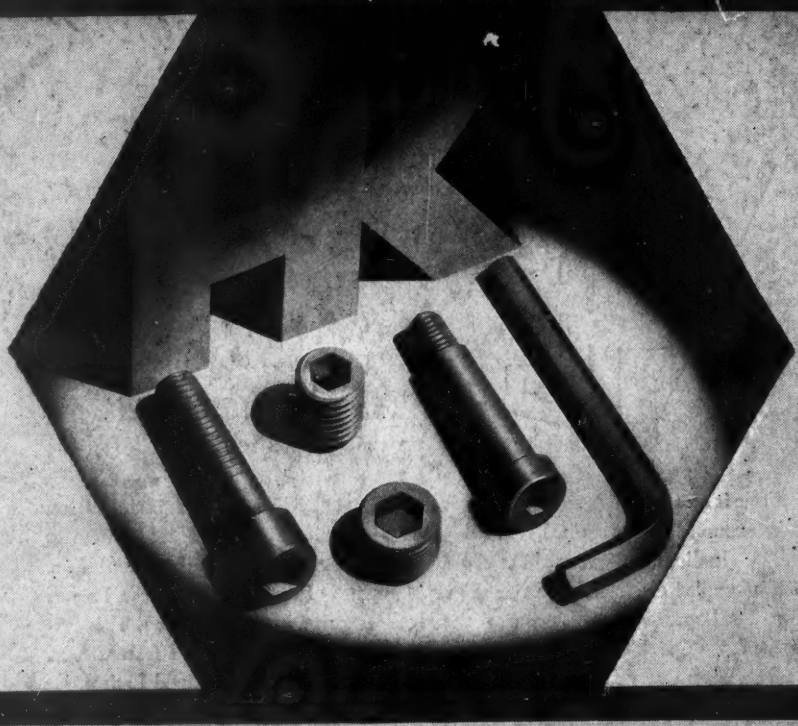
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